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Henry C. Pearson, F. R. G. S., Founder

CONTENTS

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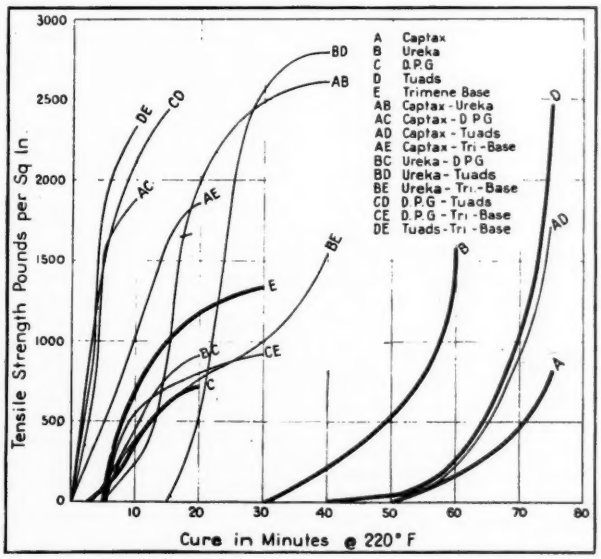
Accelerator Combinations[1]

Adaptations That Practically Eliminate Scorching, Enhance Acceleration, and Accommodate Cures to Construction, Bulk of Article, and Method of Vulcanization

WEBSTER NORRIS

MANY very active accelerators, and especially those of low critical temperatures, exhibit a pronounced tendency to cause scorching of stocks or partial vulcanization by heat of mixing, calendering, or tubing. Rapid accelerators, however, are very essential in modern rubber manufacturing. Soon after the introduction of these accelerators, compounders utilized them by modifying their action by other types of accelerators used in combination in the same rubber mixing, thus gaining practical manufacturing as well as economical advantages. Necessity for this practice is less now than formerly since the development of delayed action accelerators and improved temperature control in processing and curing. At the same time the plan is not abandoned because of its inherent advantages and adaptability.



R. T. Vanderbilt Co., Inc.

Setting-up of Accelerators and Accelerator Combinations

Since accelerators in the same class chemically, may act so differently in reality as not to be mutually replaceable, rubber compounders prefer to utilize accelerators according to action and effect rather than by chemical groups. Thus with respect to every accelerator one considers: (1) critical temperature; (2) time required for attaining maximum physical results; (3) effect on age resistance. These should coordinate with the plan of construction, the method used to cure the goods, and the working conditions they are to meet in service. This basis applies to selections of single accelerators or combinations.

The critical temperature of an accelerator is the degree of heat at which it becomes active toward the sulphur and catalyzing ingredients in the rubber mixing in the promotion of vulcanization. It marks the point at which "setting-up" or "scorching" begins, which, should it occur to any extent, will seriously impair the stock for further processing or even render it useless.

The importance of critical temperature in the setting-up or curing effect of accelerators and accelerator combinations is clearly illustrated by the results charted in the graph presented on this page. The batches for the straight accelerators tested are recorded in the first table shown on the next page.

The accelerators are proportioned in these batches to give equivalent curing effect. The sulphur amounts are those required by each accelerator respectively. The batches for testing the same accelerators in combination were prepared by mixing together equal proportions of *A* and *B*, then *A* and *C*, etc., and designated as *A B, A C, A D, A E, B C, B D, B E, C D, C E, D E.*

	A	B	C	D	E
Pale crepe	50	...	...	...	...
Smoked sheets	50	...	...	...	...
Gilders whiting	90	...	...	...	...
Zinc oxide	10	...	...	...	...
Stearic acid	1	...	...	...	...
Sulphur	2.25	2.25	2.25	1.75	1.75
Captax	1.25	...	...	...	...
Ureka	...	1.25	...	...	...
D P G	...	...	2.50	...	...
Tuads	...	...	...	0.50	...
Trimene base	...	...	...	...	2.50

The test results plotted in terms of tensile strength and the cure in minutes show the curves in two groups: (1) Those in which at 220° F. the cure begins in less than 10 minutes, indicating a readiness to scorch by accelerators *C* and *E* as well as most of the accelerator combinations tested; (2) those that do not "set up" or scorch at 220° F. in less than 30, 40, and 50 minutes. In the latter group accelerators *A*, *B*, *D*, and the mixed accelerators *A D* are included.

Maximum Physical Properties

The time required by accelerators to cure a rubber mixing to maximum physical properties is an essential that can be determined experimentally on a test mixing proportioned as follows: ribbed smoked sheets 100, zinc oxide 5, stearic acid 0.5 plus accelerator and sulphur in various ratios. These ratios are reported by chemical manufacturers with respect to the claims made concerning their accelerators.

A series of cures at a standard temperature is then made at varying times. Curves are plotted showing the tensile at break for each period of cure. Similarly a set of curves is drawn showing the modulus at 300, 400, 500, and 600 per cent elongation.

The accompanying table shows typical accelerators grouped according to their activity in vulcanizing effect. It is adapted from a paper by R. Thiollet and G. Martin[2]. The most rapid is 1, a single accelerator effecting cures in 60 minutes at 212° F.

	Chemical Names	Commercial Names
1.	Isopropyl-xanthate of zinc	.....
2.	Methyl-phenyl-dithiocarbamate of zinc	.....
3.	(a) Thiocarbanilide	Thio
	(b) Ethylidine-analine	E A
4.	(a) Mercapto-benzothiazol	Captax
	(b) Tetramethyl-thiuramdisulphide	Tuads
5.	(a) Disubstituted guanidines	DPG and DOTG
	(b) Paranitroso-dimethyl-aniline	Accelerene
6.	(a) Triphenyl-guanidine	TPG
	(b) Anhydro-formaldehyde-aniline	Methylene Aniline
	(c) Anhydro-formaldehyde-para-toluidine	Methylene-para-toluidine

CURING TIME-TEMPERATURE RELATIONS

Accelerators	Minutes of Cure	Heat of Cure: Steam kg/cm²	Heat of Cure: Degrees F.
1. Isopropyl-xanthate of zinc	10	2.0	271
2. Methyl-phenyl-dithiocarbamate of zinc	30	0.8	239
Captax with EA	25	2.0	271
Captax with DPG	40	1.5	261
3. Captax	45	3.0	292
EA	50	2.5	282
4. DOTG	70	3.0	292
Accelerene	75	2.5	282
Methylene-para-toluidine with DPG	80	3.0	292
PTXG	80	3.0	292
5. Thio	110	3.0	292

Plateau Effect

The so-called "plateau effect," as applied to an accelerator, has reference to the length and flatness shown by the stress-strain where it records the period of maximum accelerator activity. The longer the plateau, the less liability exists of overcuring. In other words, it permits long cures for vulcanizing large masses throughout with no danger of injury to the outside.

In practice such a cure may be effected by using a slow starting accelerator to allow heating the mass of the article throughout to the critical temperature of the accelerator, after which the curing heat is held the required time for vulcanization. A second method is to use an accelerator of low critical temperature and long plateau effect. A third method is by combining two accelerators in the same mixing, one of low critical temperature supplemented by one of opposite characteristics.

Accelerator Practice

Advanced compounding practice limits accelerators to as few in number as possible consistent with manufacturing conditions and service requirements of goods produced. This simplification promotes economy and obviates many errors and difficulties in stock handling. A similar rule also applies to antioxidants.

If circumstances require the use of special accelerators, there are many with characteristics adapted to suit every requirement. Long before the appearance of delayed-action accelerators, compounders resorted to meet special conditions by employing accelerator combinations, that is to say, using two accelerators in the same rubber mixing. This method is an expedient to avoid scorching stock during mixing and subsequent processing. The practice is quite common although not so necessary as formerly except in special instances such as hot-air-cured goods, etc. A well-selected accelerator combination starts the cure promptly at low temperature and sustains it well to the close, resulting in maximum physical properties at minimum cost of time, steam, and materials.

Accelerator pairs are selected experimentally from different chemical groups according to the objective desired. Combining two accelerators of the same chemical type gives merely additive effect rather than increased activity. For example, effective pairs are made by combining aldehyde anines with guanidines. Thiurams work well with accelerators of every chemical type.

Combinations for Footwear Cures

Combinations of Thionex with Accelerator 808 or Accelerator 833 are used in the shoe industry because they have a low critical temperature and an exceedingly long range of cure. Such combinations have a longer curing range than either accelerator used alone. Trimene or Trimene Base is used alone or either one in combination with D P G for shoe vulcanization.

Tetramethyl thiuram monosulphide (Monex) 1 part with D P G 3 parts is an effective combination for shoe vulcanization. Similarly tetramethyl-thiuram-disulphide (Tuads) 1 part with Captax 10 parts is practical for shoe work. Footwear cures with any of these combinations are not impaired by the presence of carbon black or litharge and do not require the presence of stearic acid. Thiurams alone in shoe work are more liable to cause scorching than the other accelerators mentioned. If used in conjunction with litharge, thiurams may cause the goods to show a galvanized appearance upon their surfaces.

Captax can be used alone for curing footwear but never in combination with D P G for any cure as that combination is practically unmanageable because of its extreme sensitivity.

Combinations for Mechanicals and Tires

A highly effective accelerator pair for mechanical goods and tire stocks is Captax 5 parts with Tuads 1 part. Captax and A-19 is a good combination for mechanicals of every kind. D P G pairs advantageously with most rapid accelerators except Captax and acts as an efficient secondary accelerator. It also counteracts the retarding effect on the cure by carbon blacks and clay. Tuads 1 part with D P G 3 parts or Tuads 1 part with Hexa 3 parts are excellent combinations for high tensile and tear resistance.

W. B. Wiegand, in the following abstract[3], indicates suit-

[2] "Essai de Classification Rationnelle des Principaux Accélérateurs de Vulcanisation." Part I. *Caoutchouc & gutta-percha*, Apr., 1929, p. 14494; Part II. *Ibid.*, Oct., 1929, p. 14722.

[3] *Trans. Inst. Rubber Ind.*, Oct., 1925, p. 145.

able accelerator pairs for curing solid tires, naming D P G for quick cure of interior with formaldehyde-paratoluidine (methylene-paratoluidine) for good aging exterior. Formaldehyde aniline and formaldehyde-orthotoluidine have also been used for this purpose. Further examples of successful accelerator combinations are thiocarbanilide with Hexa, and Hexa with D P G. These give an extremely high degree of setting up or snappiness and are thus suitable for pneumatic tire treads.

Other advantageous combinations for mold work are as follows: 3½ parts A-7 with 1 part D P G for a quick start and a firm tight cure without scorching for stocks containing as high as 25 per cent of reclaim; 10 parts of Captax with 1 part of Tuads is suitable for making a snappy five-minute mold cure for small-weight pure gum articles. Another combination for the same purpose is 5 parts Grasselerator 808 with 1 part Tuads. Para-nitroso-diphenyl-aniline (Accelerene) 1 part with D P G 3 parts or Safex 1 part with D P G 1 part is useful wherever high modulus is desired. R & H 50 can be combined satisfactorily with thiazoles, thiurams, thioureas, or guanidines for tire tread and general purposes. The combination of 1 part R & H 397 with 1/10 part Captax and 1 part Age-Rite will give 4,500 pounds tensile in a tread stock and excellent aging quality. Thiocarbanilide, when popular, was combined with Hexa for general use.

In tire treads, frictions, etc., the following combinations are advantageous: Thionex 1 part, D O T G 3 parts; Thionex 1 part, Vulcanol 5 parts. Compounds containing Thionex or combinations of Thionex with other accelerators do not attain their maximum physical properties until several days after curing. Such combinations impart a high tear resistance and long range cure. The combination of Thionex and D O T G is particularly effective in that way.

Dealers' Stocks of Rubber Footwear—March 1, 1930

THE Bureau of Foreign and Domestic Commerce announces[1] that as a result of the survey of dealers' stocks of waterproof rubber footwear in the United States as of March 1, 1930, made by the Rubber Division, 22,752 dealers reported 5,748,984 pairs on hand, an average of 253 pairs per dealer, against 26,675 dealers with 6,615,171 pairs, or 248 pairs per dealer, on July 1, 1929. The number of dealers reporting stocks of each class of rubber footwear, the number of pairs reported, and the average pairs per dealer, for the United States as a whole, are shown below for July 1, 1929, and March 1, 1930:

TABLE 1. SUMMARY OF DEALERS' STOCKS

	July 1, 1929			March 1, 1930		
	Number of Dealers	Number of Pairs	Pairs per Dealer	Number of Dealers	Number of Pairs	Pairs per Dealer
Rubber boots	19,828	588,102	29.3	16,673	550,250	33.0
Lumbermans and pacs.	10,017	294,304	29.3	8,605	243,465	28.3
Heavy arctics and gaiters	15,839	579,047	36.6	13,423	473,351	35.3
Light arctics and gaiters	15,350	910,485	59.3	12,332	608,678	49.4
Style gaiters, cloth	12,378	770,460	62.2	11,015	628,513	57.1
Style gaiters, rubber	8,353	378,684	45.3	8,783	374,921	42.7
Light and heavy rubbers	20,704	3,094,089	149.5	19,049	2,869,805	150.7
Total	26,675	6,615,171	248.0	22,752	5,748,984	252.7

Taking the total number of dealers reporting stocks as 100 per cent, the percentage of dealers who reported stocks of each class of footwear is shown in Table 2 for July 1, 1929, and March 1, 1930. A study of the percentages shows that the proportion of dealers in each group was roughly comparable for the two dates, although an increased percentage of dealers reported stocks of rubber and cloth style gaiters and rubbers this year, while a noticeably smaller percentage of dealers reported stocks of ordinary light arctics and gaiters.

Taking the total pairs of all kinds of footwear reported as 100 per cent, and calculating the percentage of the total made up of each class, the results in Table 2 also indicate that the two surveys are roughly comparable; rubber boots and rubber style gaiters constituted a larger part of the March 1, 1930, stocks than of the July 1, 1929, stocks, while stocks of light arctics and gaiters constituted a smaller percentage of the 1930 total.

The first part of Table 2 should help the manufacturer with national distribution to determine what percentage of his dealers should stock each class of footwear. For example,

[1]Special Circular No. 2650, Rubber Division, Department of Commerce, Washington, D. C.

TABLE 2. COMPARABILITY OF 1929 AND 1930 SURVEYS

	Percentage of Dealers Reporting Each Class		Percentage of Total Stock Reported for Each Class	
	July 1, 1929	March 1, 1930	July 1, 1929	March 1, 1930
Rubber boots	74.3	73.3	8.9	9.6
Lumbermans and pacs	37.6	37.8	4.4	4.2
Heavy arctics and gaiters	59.4	59.0	8.8	8.2
Light arctics and gaiters	57.5	54.2	13.8	10.6
Style gaiters, cloth	46.4	48.4	11.6	11.0
Style gaiters, rubber	31.3	38.6	5.7	6.5
Light and heavy rubbers	77.6	83.7	46.8	49.9
Total	100.0	100.0	100.0	100.0

he might figure on about 80 per cent of his dealers purchasing rubbers, 75 per cent purchasing rubber boots, 60 per cent heavy arctics and gaiters, 55 per cent light arctics and gaiters, 50 per cent cloth style gaiters, 37.5 per cent lumbermans and pacs, and 35 or 40 per cent rubber style gaiters.

The second part of the table will furnish some guide to dealers as to a normal division of stocks, when purchasing. On the basis of a season's purchase of 500 pairs, if it were divided according to the March 1 percentages in Table 2, the dealer would buy about 48 pairs of rubber boots, 21 pairs of lumbermans and pacs, 41 pairs of heavy arctics and gaiters, 53 pairs of light arctics and gaiters, 87 pairs of style gaiters (cloth and rubber), and 250 pairs of rubbers.

The varying market demand for rubber footwear in different parts of the United States is indicated by the percentages of dealers reporting stocks of each class of footwear for each region. For example, taking the total number of reporting dealers in New England as 100 per cent, 63.0 per cent of these dealers handle lumbermans and pacs, and 90.2 per cent handle rubbers, the highest percentage with stocks of these items in any region. The West South Central States, although furnishing a poor market for rubber footwear generally, show a higher percentage of dealers stocking rubber boots than any other area. The demand for rubbers and rubber boots varies less than for other items in different parts of the country. Arctics and gaiters of all kinds are most generally stocked in the North Central, New England, and Mid-Atlantic States. Compared with last year's survey, fewer dealers in the East South Central States stock each class except rubbers, while in the Mountain States an increased percentage of dealers reported for every class. This year's increase in percentage of dealers stocking rubber style gaiters and rubbers was general throughout the United States, and the lower percentage of dealers stocking light arctics and gaiters was also general.

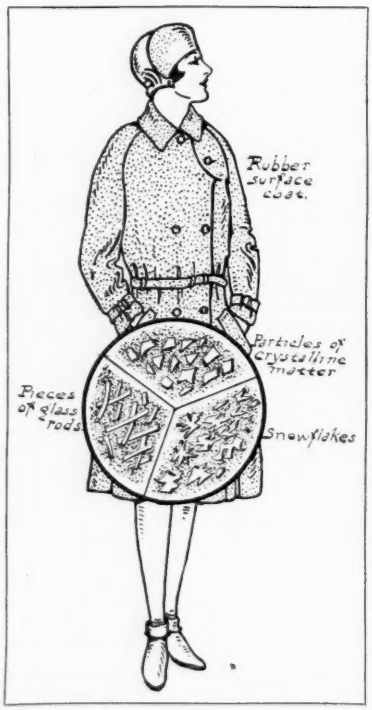
Why Colors Fade

On Modern Rainy-Day Costumes and Rubber Goods in General

GEORGE RICE

THE constantly increasing use of artistic colors in the designs used to beautify modern rainy-day costumes and modern art rubber goods in general, is in keeping with the color vogue in dress, home and garden decoration, and the handsome tints used at the present time on automobiles and airplanes.

The old gray days of the rubber wear industry have passed, and now reds, greens, blues, purples, tans, and yellows in various tones can be seen on raincoats, capes, and hats on any city street on a damp day. The designers of rainwear have created garments that make women and girls look their best regardless of stormy weather, all of which is helping to sell rubber fabrics. Moire, for example, is a successful rainproof fabric and is produced in a very extensive range of colors. It is concerning the failure of these colors at times and under various conditions that this article is written. Ordinarily the colors in rubber surfaced coats are fast in regard to the service for which the garment is intended: namely, rain and dampness, and the mold or the mildew that might accumulate on the fabric when the garment is placed away in a wet state. But rubberized apparel is often subjected to strong sunlight when worn before or after a shower or when hung in a dealer's show window.



A Microscopical Examination of the Molecular Structure of a Color on a Rubber Garment Will Show That This Structure Resembles Pieces of Glass Rods, Crystalline Matter, or Snowflakes

Indeed, fading may be caused in some of the most brilliantly colored raincoats by bacteriological action on the ingredients composing the colors, when the garments are in storage. Heavy or light rains, daylight, or artificial light may have nothing to do with the weakening of colors on rubber which in the beginning presented no indications of fugitiveness. Excessive rubbing may wear down a color in time, and even perspiration can change a color in spots because of the contained acid. Other more or less remote causes for color failure on rubber goods exist, but the principal question is why does a good color efficiently made on rubber succumb in luster under certain conditions of exposure and sometimes through normal wear? The manufacturers of chemicals used in coloring rubber are providing the trade with a superior grade of these materials, and as a rule the colors are proficiently applied.

Light itself does not possess the necessary properties to bring on color weakness. But the light rays can start up an intra-molecular action in the color particles that will change the color. Light rays differ in nature in the various types of light to which all costumes are subjected at some time. The rubberized garment may have to submit its color to the action of the light rays from a powerful artificial light in a show window and to daylight which comes through the plate glass. Those particular rays of light are absorbed by the color and create a disturbance within it that usually results in fading. Of course oxidation and color reduction under certain influences will bring about fading, but the element of light rays must be present in the light itself if definite results are to be had, regardless of any chemical actions.

Many of the wave lengths present in natural light are absent in electric light. Fading possibilities tested by one form of light may differ with another. The modern type of fadeometers, however, are fairly accurate in making tests of the durability of colors on anything.

Every substance is made up of minute particles too small to see, even when good magnifying instruments are used. Dyestuff molecules resemble pieces of glass rods or particles of crystalline matter or snowflakes, if viewed under a microscope. If it were possible to place a sufficiently strong glass on a raincoat, the enlarged specimens of molecules might look similar to one of the groups shown in the accompanying illustration.

If the substance used in coloring rubber possesses stability in its molecular structure, it will be capable of absorbing whatever type of light rays it has to confront, better than a coloring substance possessing weak molecules. The light rays create a vibrating movement within the coloring ingredients which is best opposed with strong molecules. You can make some of the flavaniline colors take on a green hue under the action of a strong ultra-violet ray light only to see them assume a yellow tinge when taken away from the light. Even the best of natural or synthetic indigo blue colors still fade a little in light only to return to their normal density when placed in the shade for a time. Natural light is the most effective because it contains both long and short wave lengths, whereas some of the man-made lights contain only long or short wave lengths. Fading by bacteriological action will be considered in a forthcoming article.

Synchronous Motor Provides Most Economical Drive for Plasticator

HOMER W. FORSCHNER[1]

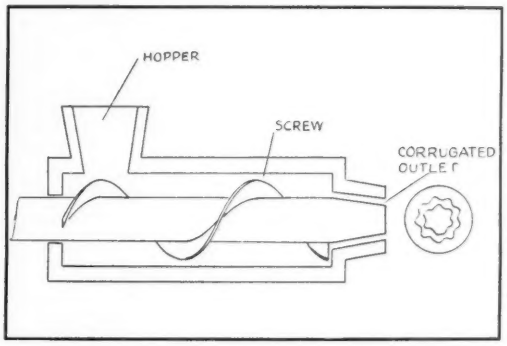


Fig. 1. Schematic Diagram of Plasticator

A COMPARATIVELY new type of machine for breaking down crude rubber, the Gordon plasticator, is another of the many applications that have been found to be driven most successfully and economically by the synchronous motor.

Fig. 3. Automatic Starter

Description of Plasticator

The plasticator is a machine which treats the crude rubber by breaking it down and masticating it to such a thorough extent that it is ready for the mixing mills without further preparation. A description of the principles of the machine will be of interest and will show the nature of the load imposed on the motor. The plasticator is very much like a meat grinder, with the exception that as the material leaves the screw, it is forced through a circular converging conical opening and undergoes a rubbing or rolling action before being discharged. The baled crude rubber is cut into three chunks averaging about 60 pounds each and introduced into the hopper.

Turning at a speed of 20 r.p.m., the screw pulls the chunk of crude rubber into the barrel of the machine, where it is torn apart and masticated. When the rubber reaches the end of the screw, it has been partially broken down by this treatment and is in a semi-plastic state. The screw forces the material into the circular opening, a cross-section view of which is shown at the right of Fig. 1. It is seen that both the revolving cone and the stationary member are fluted. As the rubber is forced through the opening between the two members, it is given a rubbing action with a resultant effect similar to passage between the rolls of the ordinary mill. The revolving cone, being on the same axis as the screw, also turns at 20 r.p.m. The rubber comes between two rubbing surfaces numerous times before being discharged and receives a working equivalent to eight or ten minutes in a mill. The radial clearance between the cone and the stationary member may be varied from approximately $\frac{3}{16}$-inch to $\frac{5}{8}$-inch with a subsequent change in plasticity.

Approximately 3,500 pounds of average stock per hour are discharged from the machine in the form of a tube about six inches in diameter with a $\frac{3}{4}$-inch to 1-inch wall. The tube is sliced into convenient lengths to handle and put into the compound batches.

Drive Requirements

From the above description of the load to be driven it is seen that a suitable motor, among other things, should have the following characteristics: (1) ample torques for all operating conditions, (2) constant speed, (3) high power-conversion efficiency. The synchronous motor, better than any other type, meets the requirements and in addition corrects power factor.

Synchronous Motor Drive

An important reason for selecting a synchronous motor is the power factor correction to be obtained with its use. It can be designed to operate at unity power factor, with a minimum of armature current, or at a leading power factor to deliver a leading current, which will compensate the

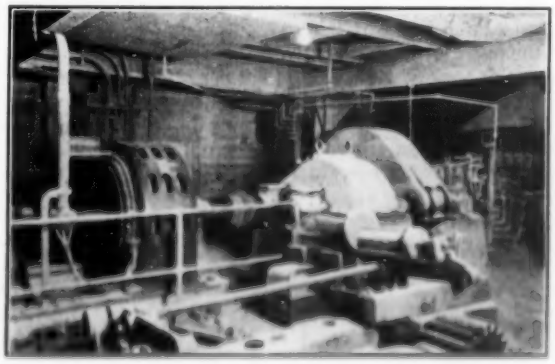


Fig. 2. Synchronous Motor Drive

[1] Engineer, Electric Machinery Mfg. Co., Minneapolis, Minn.

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Plateau Effect

The so-called "plateau effect," as applied to an accelerator, has reference to the length and flatness shown by the stress-strain where it records the period of maximum accelerator activity. The longer the plateau, the less liability exists of overcuring. In other words, it permits long cures for vulcanizing large masses throughout with no danger of injury to the outside.

In practice such a cure may be effected by using a slow starting accelerator to allow heating the mass of the article throughout to the critical temperature of the accelerator, after which the curing heat is held the required time for vulcanization. A second method is to use an accelerator of low critical temperature and long plateau effect. A third method is by combining two accelerators in the same mixing, one of low critical temperature supplemented by one of opposite characteristics.

[2] "Essai de Classification Rationnelle des Principaux Accélérateurs de Vulcanisation." Part I. *Caoutchouc & gutta-percha*, Apr., 1929, p. 14494; Part II, *Ibid.*, Oct., 1929, p. 14722.

Accelerator Practice

Advanced compounding practice limits accelerators to as few in number as possible consistent with manufacturing conditions and service requirements of goods produced. This simplification promotes economy and obviates many errors and difficulties in stock handling. A similar rule also applies to antioxidants.

If circumstances require the use of special accelerators, there are many with characteristics adapted to suit every requirement. Long before the appearance of delayed-action accelerators, compounders resorted to meet special conditions by employing accelerator combinations, that is to say, using two accelerators in the same rubber mixing. This method is an expedient to avoid scorching stock during mixing and subsequent processing. The practice is quite common although not so necessary as formerly except in special instances such as hot-air-cured goods, etc. A well-selected accelerator combination starts the cure promptly at low temperature and sustains it well to the close, resulting in maximum physical properties at minimum cost of time, steam, and materials.

Accelerator pairs are selected experimentally from different chemical groups according to the objective desired. Combining two accelerators of the same chemical type gives merely additive effect rather than increased activity. For example, effective pairs are made by combining aldehyde anines with guanidines. Thiurams work well with accelerators of every chemical type.

Combinations for Footwear Cures

Combinations of Thionex with Accelerator 808 or Accelerator 833 are used in the shoe industry because they have a low critical temperature and an exceedingly long range of cure. Such combinations have a longer curing range than either accelerator used alone. Trimene or Trimene Base is used alone or either one in combination with D P G for shoe vulcanization.

Tetramethyl thiuram monosulphide (Monex) 1 part with D P G 3 parts is an effective combination for shoe vulcanization. Similarly tetramethyl-thiuram-disulphide (Tuads) 1 part with Captax 10 parts is practical for shoe work. Footwear cures with any of these combinations are not impaired by the presence of carbon black or litharge and do not require the presence of stearic acid. Thiurams alone in shoe work are more liable to cause scorching than the other accelerators mentioned. If used in conjunction with litharge, thiurams may cause the goods to show a galvanized appearance upon their surfaces.

Captax can be used alone for curing footwear but never in combination with D P G for any cure as that combination is practically unmanageable because of its extreme sensitivity.

Combinations for Mechanicals and Tires

A highly effective accelerator pair for mechanical goods and tire stocks is Captax 5 parts with Tuads 1 part. Captax and A-19 is a good combination for mechanicals of every kind. D P G pairs advantageously with most rapid accelerators except Captax and acts as an efficient secondary accelerator. It also counteracts the retarding effect on the cure by carbon blacks and clay. Tuads 1 part with D P G 3 parts or Tuads 1 part with Hexa 3 parts are excellent combinations for high tensile and tear resistance.

W. B. Wiegand, in the following abstract[3], indicates suit-

[3] *Trans. Inst. Rubber Ind.*, Oct., 1925, p. 145.

able accelerator pairs for curing solid tires, naming D P G for quick cure of interior with formaldehyde-paratoluidine (methylene-paratoluidine) for good aging exterior. Formaldehyde aniline and formaldehyde-orthotoluidine have also been used for this purpose. Further examples of successful accelerator combinations are thiocarbanilide with Hexa, and Hexa with D P G. These give an extremely high degree of setting up or snappiness and are thus suitable for pneumatic tire treads.

Other advantageous combinations for mold work are as follows: 3½ parts A-7 with 1 part D P G for a quick start and a firm tight cure without scorching for stocks containing as high as 25 per cent of reclaim; 10 parts of Captax with 1 part of Tuads is suitable for making a snappy five-minute mold cure for small-weight pure gum articles. Another combination for the same purpose is 5 parts Grasselerator 808 with 1 part Tuads. Para-nitroso-diphenyl-aniline (Accelerene) 1 part with D P G 3 parts or Safex 1 part with D P G 1 part is useful wherever high modulus is desired. R & H 50 can be combined satisfactorily with thiazoles, thiurams, thioureas, or guanidines for tire tread and general purposes. The combination of 1 part R & H 397 with 1/10 part Captax and 1 part Age-Rite will give 4,500 pounds tensile in a tread stock and excellent aging quality. Thiocarbanilide, when popular, was combined with Hexa for general use.

In tire treads, frictions, etc., the following combinations are advantageous: Thionex 1 part, D O T G 3 parts; Thionex 1 part, Vulcanol 5 parts. Compounds containing Thionex or combinations of Thionex with other accelerators do not attain their maximum physical properties until several days after curing. Such combinations impart a high tear resistance and long range cure. The combination of Thionex and D O T G is particularly effective in that way.

Dealers' Stocks of Rubber Footwear—March 1, 1930

THE Bureau of Foreign and Domestic Commerce announces[1] that as a result of the survey of dealers' stocks of waterproof rubber footwear in the United States as of March 1, 1930, made by the Rubber Division, 22,752 dealers reported 5,748,984 pairs on hand, an average of 253 pairs per dealer, against 26,675 dealers with 6,615,171 pairs, or 248 pairs per dealer, on July 1, 1929. The number of dealers reporting stocks of each class of rubber footwear, the number of pairs reported, and the average pairs per dealer, for the United States as a whole, are shown below for July 1, 1929, and March 1, 1930:

TABLE 1. SUMMARY OF DEALERS' STOCKS

	July 1, 1929			March 1, 1930		
	Number of Dealers	Number of Pairs	Pairs per Dealer	Number of Dealers	Number of Pairs	Pairs per Dealer
Rubber boots	19,828	588,102	29.3	16,673	550,250	33.0
Lumbermans and pacs.	10,017	294,304	29.3	8,605	243,465	28.3
Heavy arctics and gaiters	15,839	579,047	36.6	13,423	473,351	35.3
Light arctics and gaiters	15,350	910,485	59.3	12,332	608,678	49.4
Style gaiters, cloth	12,378	770,460	62.2	11,015	628,513	57.1
Style gaiters, rubber	8,353	378,684	45.3	8,783	374,921	42.7
Light and heavy rubbers	20,704	3,094,089	149.5	19,049	2,869,805	150.7
Total	26,675	6,615,171	248.0	22,752	5,748,984	252.7

Taking the total number of dealers reporting stocks as 100 per cent, the percentage of dealers who reported stocks of each class of footwear is shown in Table 2 for July 1, 1929, and March 1, 1930. A study of the percentages shows that the proportion of dealers in each group was roughly comparable for the two dates, although an increased percentage of dealers reported stocks of rubber and cloth style gaiters and rubbers this year, while a noticeably smaller percentage of dealers reported stocks of ordinary light arctics and gaiters.

Taking the total pairs of all kinds of footwear reported as 100 per cent, and calculating the percentage of the total made up of each class, the results in Table 2 also indicate that the two surveys are roughly comparable; rubber boots and rubber style gaiters constituted a larger part of the March 1, 1930, stocks than of the July 1, 1929, stocks, while stocks of light arctics and gaiters constituted a smaller percentage of the 1930 total.

The first part of Table 2 should help the manufacturer with national distribution to determine what percentage of his dealers should stock each class of footwear. For example,

[1]Special Circular No. 2650, Rubber Division, Department of Commerce, Washington, D. C.

TABLE 2. COMPARABILITY OF 1929 AND 1930 SURVEYS

	Percentage of Dealers Reporting Each Class		Percentage of Total Stock Reported for Each Class	
	July 1, 1929	March 1, 1930	July 1, 1929	March 1, 1930
Rubber boots	74.3	73.3	8.9	9.6
Lumbermans and pacs	37.6	37.8	4.4	4.2
Heavy arctics and gaiters	59.4	59.0	8.8	8.2
Light arctics and gaiters	57.5	54.2	13.8	10.6
Style gaiters, cloth	46.4	48.4	11.6	11.0
Style gaiters, rubber	31.3	38.6	5.7	6.5
Light and heavy rubbers	77.6	83.7	46.8	49.9
Total	100.0	100.0	100.0	100.0

he might figure on about 80 per cent of his dealers purchasing rubbers, 75 per cent purchasing rubber boots, 60 per cent heavy arctics and gaiters, 55 per cent light arctics and gaiters, 50 per cent cloth style gaiters, 37.5 per cent lumbermans and pacs, and 35 or 40 per cent rubber style gaiters.

The second part of the table will furnish some guide to dealers as to a normal division of stocks, when purchasing. On the basis of a season's purchase of 500 pairs, if it were divided according to the March 1 percentages in Table 2, the dealer would buy about 48 pairs of rubber boots, 21 pairs of lumbermans and pacs, 41 pairs of heavy arctics and gaiters, 53 pairs of light arctics and gaiters, 87 pairs of style gaiters (cloth and rubber), and 250 pairs of rubbers.

The varying market demand for rubber footwear in different parts of the United States is indicated by the percentages of dealers reporting stocks of each class of footwear for each region. For example, taking the total number of reporting dealers in New England as 100 per cent, 63.0 per cent of these dealers handle lumbermans and pacs, and 90.2 per cent handle rubbers, the highest percentage with stocks of these items in any region. The West South Central States, although furnishing a poor market for rubber footwear generally, show a higher percentage of dealers stocking rubber boots than any other area. The demand for rubbers and rubber boots varies less than for other items in different parts of the country. Arctics and gaiters of all kinds are most generally stocked in the North Central, New England, and Mid-Atlantic States. Compared with last year's survey, fewer dealers in the East South Central States stock each class except rubbers, while in the Mountain States an increased percentage of dealers reported for every class. This year's increase in percentage of dealers stocking rubber style gaiters and rubbers was general throughout the United States, and the lower percentage of dealers stocking light arctics and gaiters was also general.

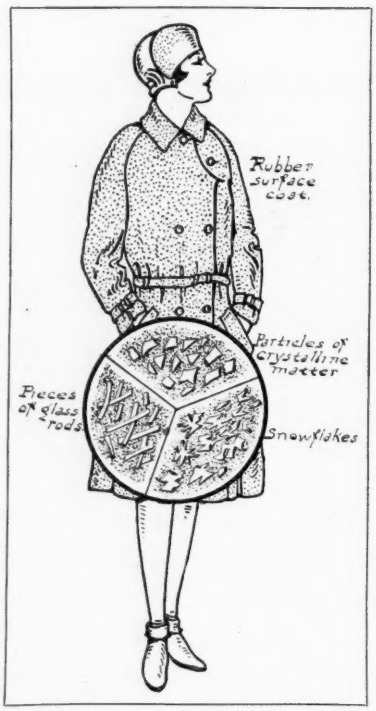
Why Colors Fade

On Modern Rainy-Day Costumes and Rubber Goods in General

GEORGE RICE

THE constantly increasing use of artistic colors in the designs used to beautify modern rainy-day costumes and modern art rubber goods in general, is in keeping with the color vogue in dress, home and garden decoration, and the handsome tints used at the present time on automobiles and airplanes.

The old gray days of the rubber wear industry have passed, and now reds, greens, blues, purples, tans, and yellows in various tones can be seen on raincoats, capes, and hats on any city street on a damp day. The designers of rainwear have created garments that make women and girls look their best regardless of stormy weather, all of which is helping to sell rubber fabrics. Moire, for example, is a successful rainproof fabric and is produced in a very extensive range of colors. It is concerning the failure of these colors at times and under various conditions that this article is written. Ordinarily the colors in rubber surfaced coats are fast in regard to the service for which the garment is intended: namely, rain and dampness, and the mold or the mildew that might accumulate on the fabric when the garment is placed away in a wet state. But rubberized apparel is often subjected to strong sunlight when worn before or after a shower or when hung in a dealer's show window.



A Microscopical Examination of the Molecular Structure of a Color on a Rubber Garment Will Show That This Structure Resembles Pieces of Glass Rods, Crystalline Matter, or Snowflakes

Indeed, fading may be caused in some of the most brilliantly colored raincoats by bacteriological action on the ingredients composing the colors, when the garments are in storage. Heavy or light rains, daylight, or artificial light may have nothing to do with the weakening of colors on rubber which in the beginning presented no indications of fugitiveness. Excessive rubbing may wear down a color in time, and even perspiration can change a color in spots because of the contained acid. Other more or less remote causes for color failure on rubber goods exist, but the principal question is why does a good color efficiently made on rubber succumb in luster under certain conditions of exposure and sometimes through normal wear? The manufacturers of chemicals used in coloring rubber are providing the trade with a superior grade of these materials, and as a rule the colors are proficiently applied.

Light itself does not possess the necessary properties to bring on color weakness. But the light rays can start up an intra-molecular action in the color particles that will change the color. Light rays differ in nature in the various types of light to which all costumes are subjected at some time. The rubberized garment may have to submit its color to the action of the light rays from a powerful artificial light in a show window and to daylight which comes through the plate glass. Those particular rays of light are absorbed by the color and create a disturbance within it that usually results in fading. Of course oxidation and color reduction under certain influences will bring about fading, but the element of light rays must be present in the light itself if definite results are to be had, regardless of any chemical actions.

Many of the wave lengths present in natural light are absent in electric light. Fading possibilities tested by one form of light may differ with another. The modern type of fadeometers, however, are fairly accurate in making tests of the durability of colors on anything.

Every substance is made up of minute particles too small to see, even when good magnifying instruments are used. Dyestuff molecules resemble pieces of glass rods or particles of crystalline matter or snowflakes, if viewed under a microscope. If it were possible to place a sufficiently strong glass on a raincoat, the enlarged specimens of molecules might look similar to one of the groups shown in the accompanying illustration.

If the substance used in coloring rubber possesses stability in its molecular structure, it will be capable of absorbing whatever type of light rays it has to confront, better than a coloring substance possessing weak molecules. The light rays create a vibrating movement within the coloring ingredients which is best opposed with strong molecules. You can make some of the flavaniline colors take on a green hue under the action of a strong ultra-violet ray light only to see them assume a yellow tinge when taken away from the light. Even the best of natural or synthetic indigo blue colors still fade a little in light only to return to their normal density when placed in the shade for a time. Natural light is the most effective because it contains both long and short wave lengths, whereas some of the man-made lights contain only long or short wave lengths. Fading by bacteriological action will be considered in a forthcoming article.

Synchronous Motor Provides Most Economical Drive for Plasticator

HOMER W. FORSCHNER[1]

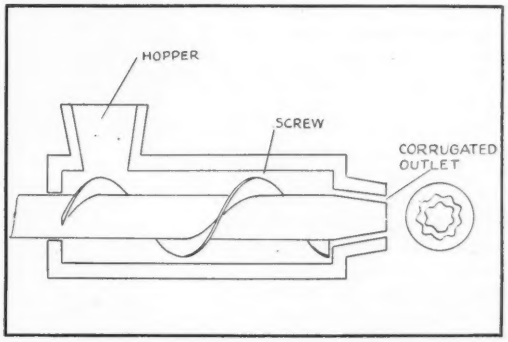


Fig. 1. Schematic Diagram of Plasticator

A COMPARATIVELY new type of machine for breaking down crude rubber, the Gordon plasticator, is another of the many applications that have been found to be driven most successfully and economically by the synchronous motor.

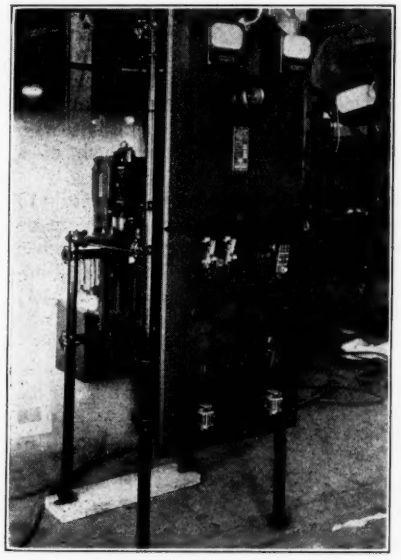


Fig. 3. Automatic Starter

Description of Plasticator

The plasticator is a machine which treats the crude rubber by breaking it down and masticating it to such a thorough extent that it is ready for the mixing mills without further preparation. A description of the principles of the machine will be of interest and will show the nature of the load imposed on the motor. The plasticator is very much like a meat grinder, with the exception that as the material leaves the screw, it is forced through a circular converging conical opening and undergoes a rubbing or rolling action before being discharged. The baled crude rubber is cut into three chunks averaging about 60 pounds each and introduced into the hopper.

Turning at a speed of 20 r.p.m., the screw pulls the chunk of crude rubber into the barrel of the machine, where it is torn apart and masticated. When the rubber reaches the end of the screw, it has been partially broken down by this treatment and is in a semi-plastic state. The screw forces the material into the circular opening, a cross-section view of which is shown at the right of Fig. 1. It is seen that both the revolving cone and the stationary member are fluted. As the rubber is forced through the opening between the two members, it is given a rubbing action with a resultant effect similar to passage between the rolls of the ordinary mill. The revolving cone, being on the same axis as the screw, also turns at 20 r.p.m. The rubber comes between two rubbing surfaces numerous times before being discharged and receives a working equivalent to eight or ten minutes in a mill. The radial clearance between the cone and the stationary member may be varied from approximately $\frac{3}{16}$-inch to $\frac{5}{8}$-inch with a subsequent change in plasticity.

Approximately 3,500 pounds of average stock per hour are discharged from the machine in the form of a tube about six inches in diameter with a $\frac{3}{4}$-inch to 1-inch wall. The tube is sliced into convenient lengths to handle and put into the compound batches.

Drive Requirements

From the above description of the load to be driven it is seen that a suitable motor, among other things, should have the following characteristics: (1) ample torques for all operating conditions, (2) constant speed, (3) high power-conversion efficiency. The synchronous motor, better than any other type, meets the requirements and in addition corrects power factor.

Synchronous Motor Drive

An important reason for selecting a synchronous motor is the power factor correction to be obtained with its use. It can be designed to operate at unity power factor, with a minimum of armature current, or at a leading power factor to deliver a leading current, which will compensate the

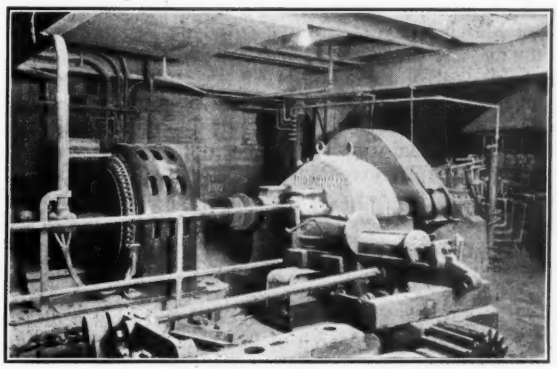


Fig. 2. Synchronous Motor Drive

[1] Engineer, Electric Machinery Mfg. Co., Minneapolis, Minn.

lagging or magnetizing current of induction motors. This acts to raise the power factor of the whole plant, and, whether power is purchased or privately generated, the maintenance of high plant power factor will result in economies.

The synchronous motor applied to this drive, shown in Fig. 2, is a 250 h.p. 514 r.p.m. machine designed for 80 per cent leading power factor operation and as such supplies considerable leading current for compensating the lagging current from induction motors. Power factor correction is very economically obtained in the higher speed motors, such as this one, because of the lower first cost of high-speed motors as compared to that of low-speed ones such as are direct connected to mill lines.

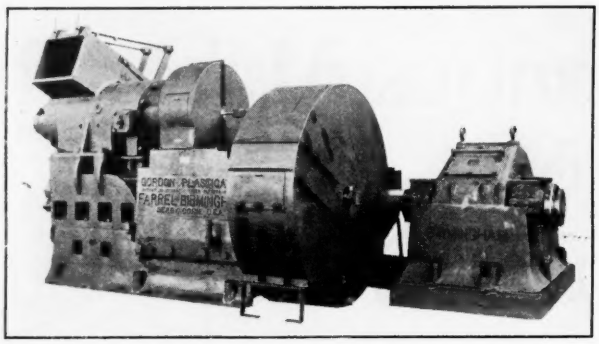


Fig. 4. Double Plasticator

Ordinarily the plasticator is started empty and requires only a nominal horsepower. To provide for an emergency, such as restarting after a power outage with the barrel fully loaded, the motor is designed with high starting and pull-in torques. This enables the motor to start and synchronize under practically any operating condition. However, when shutting down for a period of time, material should not be left in the plasticator to cool and harden as unnecessary strain is then imposed on all the machinery at starting.

The running load is quite constant, tests showing the average during operation to be about 240 h.p. with maximum peaks of 275 h.p.

Automatic Control

The control is a feature of importance in insuring continuous operation. It is of the automatic push-button type with across the-line starting and is shown in Fig. 3. Field excitation is applied by a frequency relay at the correct percentage of synchronous speed. The frequency relay will remove the field excitation if the motor drops below synchronous speed during a momentary power dip. Upon restoration of voltage the motor automatically resynchronizes and production continues uninterrupted.

The above description applies to what is known as the single plasticator. Double plasticators (Fig. 4) are also in use and are essentially two single units in series driven by a single motor. The double unit has an output of approximately 6,500 pounds per hour and requires a 500 h.p. motor of practically the same characteristics as described above.

Summary

The initial cost of the synchronous motor compares favorably with other types. The advantages and features of the synchronous drive discussed above may be summed up as follows:

Power Factor Correction. Motor improves power factor of whole plant with a resultant saving in power cost.

Constant Speed. Absolutely constant speed insures a maximum output and a uniform plasticity of the material.

Small Maintenance. Because of the large air gap inherent to the synchronous motor, there is need for much less maintenance on the bearings.

Automatic Full Voltage Starting. The completely automatic starter with frequency relay control insures correct starting and synchronizing under all conditions with complete protection to the motor—all at the touch of a button.

Full voltage starting has the following advantages: (1) Elimination of a second peak current inrush, or "bump on the line," which takes place in reduced voltage starting when the motor is thrown from reduced to full voltage; (2) Simplified starting equipment and reduced maintenance; (3) Reduced first cost of starting equipment.

Industry and Trade

National Industrial Conference Board Report

Automobiles—Rubber—Petroleum

MARCH production of passenger cars and trucks, estimated at 415,000 units, is 22 per cent larger than February but 33.7 per cent lower than the extraordinary total of March last year. March output is 10.5 per cent below the average for the last five years while the first quarter output this year of 1,038,068 is 8.0 per cent under the average of 1,129,844 for the first three months during the past five years. Manufacturers are strictly limiting their output according to actual consumer demand, but they increased production in April over March. New car registrations in February were 10.0 per cent under February last year while that of trucks was only 2.2 per cent below the record of last year. New car registrations in February showed an increase of 18 per cent over January, while new truck registrations gained 5.0 per cent. Sixteen states reporting for March showed a gain of 56.6 per cent over February but a decline of 11.8 per cent under March of last year for new passenger car registrations.

While the consumption of crude rubber of all classes by manufacturers in March was 19.7 per cent less than a year ago, it should be remembered that automobile production was less than last year. Compared with February there was an increase of 9.7 per cent. European interests are planning lessened production in the hope of improving prices.

Latest estimates place crude oil production in the United States at 2,530,000 barrels daily, a decrease of almost 450,000 barrels from the high point, August, 1929, and one of about 125,000 barrels from the first of the year. Crude runs to stills for the week ending April 5 at 2,551,800 barrels daily, show a decrease of over 100,000 barrels per day compared with March 1. Preliminary estimates of the consumption of refinery gasoline during the first quarter of 1930 indicate an increase of 12.95 per cent in the combined domestic and export demand over the same period of 1929.

Recent advances of 10 cents per barrel in Texas and mid-continent crude oils have been taken by the industry as a reflection of the improvement in the relationship between the supplies of crude and refined products and the market demand.

Recently Developed Instruments *for* Tire Vulcanizing Processes

R. E. OLSON[1]

DURING the past year definite progress has been made toward the attainment of equipment for the complete automatic control of time, temperature, and pressure in vulcanizing processes. Assuming that the stock has been correctly compounded, it is essential for maintenance of consistent quality of the finished product that vulcanization be conducted under uniform conditions. Not only must control be exercised over the elements of time and temperature quantitatively, but their relation to one another in the sequence of their application must be accurately controlled. This should be accomplished without dependence on the ever-uncertain human element.

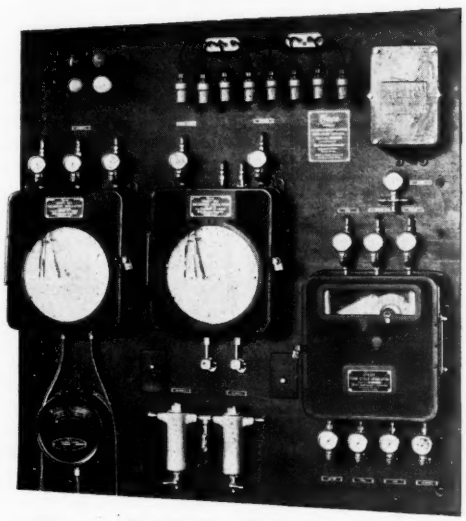


Fig. 1. Automatic Vulcanizer Operation Control

The object of this paper is to give a general description of two major developments in instrument control, stressing in particular the advantages derived from their use as well as the extent to which they automatically control the curing cycle. The first development to be described is a system of control which has proven successful for vertical tire vulcanizers. This automatic vulcanizer operation control completely eliminates hand manipulation of instruments and valves. It is only necessary for the heater tender to open the valve in the hydraulic line to the ram after which subsequent operations accurately occur until the end of the cycle.

Figure 1 illustrates a unit for one vulcanizer, consisting of a panel board on which the necessary instrument equipment is mounted. Electric clocks are used for operating the instruments, and these in turn pneumatically actuate diaphragm valves which regulate the mediums under control such as water, steam, and air. The equipment is assembled as a unit, making installation comparatively easy. Alternating current and compressed air are connected to the panel. From a manifold at the bottom of the panel, connections are made to the diaphragm valves in the vulcanizer pit with ⅛-inch brass pipe or copper tubing.

This particular unit was designed for air bag curing, and the description which follows applies for this method. However, it is equally applicable for water bag and other curing methods.

The vulcanizer is loaded and closed in the customary way. The heater tender then opens the hydraulic line and when the desired pressure is exerted on the ram, the curing cycle starts. From then on, the following operations are performed automatically:

1. Air is admitted to the air bags for a period sufficient for filling.

2. The air bag supply is then shut off for a fixed period for making the air leak test. If the pressure drop does not exceed the permissible amount at the end of the allowed period, the next operation in the cycle occurs. If the pressure drop is more than the maximum permitted, a signal is given in the form of a red light, and no further operations can take place until the cause of the excessive air leakage has been remedied. One minute before the end of the bag-filling period the drain valve is made to close. Provision is made in the equipment for resuming the normal cycle even if the heater fails to pass the air leak test, but this can be done only by the supervisor or some person especially delegated to assume this responsibility.

3. Assuming that the air leak test did not indicate an excessive pressure drop, next the steam is turned on for the curing period during which the steam temperature within the vulcanizer is controlled and the condensate discharged.

4. Five minutes before the end of the cure the equipment functions to make a second air leak test. The red lamp signal is again given if an excessive air leak has developed during the cure, but this condition does not prevent the completion of the cycle as in the case of the first leak test. If the leak has remained within the allowable amount, no signal is given.

5. At the end of the curing period the steam shuts off, cooling water is admitted to the vulcanizer, and the drain valve opens.

6. At the end of the cooling period the water shuts off and the air bag supply is cut off and the bags deflated. A green light then signals that the cycle is finished, and it only remains for the operator to release the hydraulic ram pressure and unload the vulcanizer.

7. The equipment resets itself to the starting position for the next cure, which starts only after the hydraulic pressure in the ram reaches the correct value.

The condition of the equipment is at all times indicated by four signal lights. A white light burns all the time except when the current to the panel is turned off. A red light burns owing to the failure of the heater to pass either air leak test and continues to burn until it is manually shut off. A green light burns whenever the equipment stops and serves to indicate when the cycle has been completed. A blue light burns whenever the temperature of the vulcanizer becomes excessive or when it exceeds the correct curing tem-

[1] Manager, Sales Engineering Department, Taylor Instrument Cos., Rochester, N. Y. Paper read before the Chicago Group, Rubber Division, A.C.S., Jan. 17, 1930. Publication permitted by *Ind. Eng. Chem.*

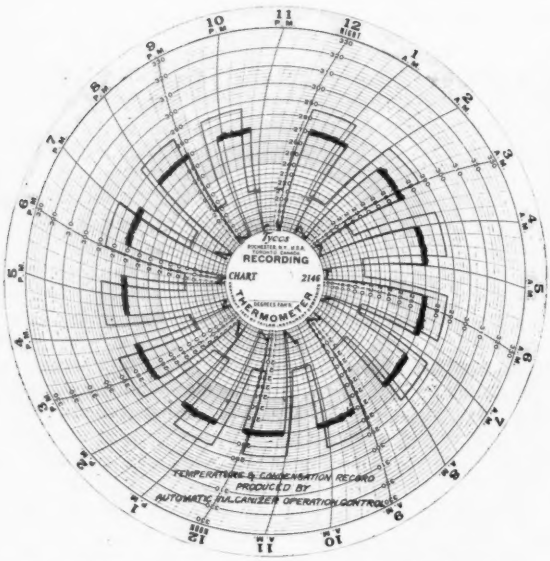


Fig. 2. Thermometer Chart Record of Vulcanizer and Condensation Temperatures

perature by a predetermined number of degrees.

It will be seen that this automatic control completely eliminates the personal element, a fact which assures uniformity of curing procedure with unfailing precision. The men working the heats do not touch the controlling instruments, which are in charge of a supervisor whose duty it is to maintain them, change charts, and to make adjustments for different curing schedules when necessary.

The dependable performance possible with this type of equipment can be judged by the fact that it has handled the entire production of one well-known plant for a considerable period—twenty-six vulcanizers being used.

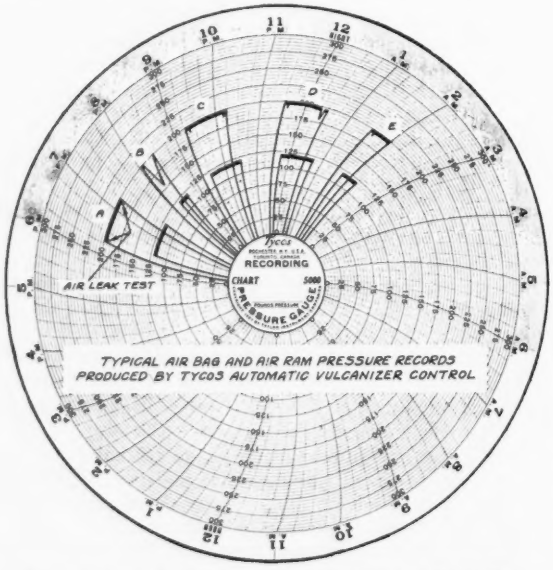


Fig. 3. A, Perfect Cure; B, Excessive Air Leak Revealed by First Test, Making It Necessary to Rework Heat; C, Satisfactory Record After Trouble Indicated on Chart B Has Been Remedied; D, Note Decreasing Air Bag Pressure During Cure Resulting in Failure to Pass Second Air Leak Test; E, Failure of Hydraulic Pressure During Cure Resulting in Immediate Release of Internal Air Bag Pressure

In addition to controlling the cycle of operation, the equipment records temperatures and pressures as well and provides a written record of its performance. Figure 2 shows the recording thermometer chart giving a record of the vulcanizer and condensation temperatures. Knowing the condensation temperatures during each cure is of great value. A regular oscillation on the chart indicates normal operation. If a straight line is produced at approximately the vulcanizer temperature, this indicates that condensate and a considerable quantity of useful steam is discharging, constituting a source of waste and inefficient steam utilization. A constantly declining curve indicates obstruction of the condensate discharge, a condition leading to nonuniform heat distribution in the vulcanizer with the consequent ill effect on the product.

Figure 3 illustrates a typical record of internal air bag and hydraulic ram pressures. These records are made on the same chart and show the extent of the bag pressure drop during each air leak test and the pressure maintained on the ram. This information is invaluable for checking uniformity of curing operations.

The automatic control accurately reproduces curing conditions, and the following are some of the outstanding advantages from its use. The ram pressure must be applied before air can enter the air bags. If the hydraulic pressure falls below a predetermined value during any part of the cure, the pressure within the bags automatically is discharged. This eliminates any possibility of the molds being forced open because of excessive bag pressure or insufficient ram pressure.

The bad effect of air leaks in vulcanizers due to faulty or loose bag connections is well recognized. It is an important contributing factor for defective tires for two main reasons. First, an excessive air leak causes underinflation of curing bags. Secondly, excessive air leaks cause air pockets in the mold stack as well as between the molds and the heater shell. The insulating effect of this air results in uneven heat distribution within the vulcanizer, a recognized cause for soft cures. This condition cannot exist in a heater equipped with this form of control. As before mentioned, a red signal lights when the air leakage is greater than permitted, and the equipment ceases to function. After this signal the heater tender is powerless to continue the curing cycle until the leak has been remedied.

The purpose of the second air leak test is to indicate whether excessive leakage has developed during the cure. Although the equipment does not stop if this second test shows a leakage greater than the acceptable amount, the extent of it is recorded on the air bag pressure chart. Precaution can then be taken to look for faulty joints when making connections for the next time.

The fact that this equipment provides an automatic cooling period is also important. Stock is compounded for an assumed heat treatment. It is therefore desirable that molds are at approximately the same temperature at the beginning of each heat when green tires are placed in them. This condition is assured because the molds are cooled only on a definite period for each heat. If cooling is manually controlled, the temperature of molds may vary considerably at the start of each cure. It is known that with present-day curing accelerators a stock developed for warm molds cannot cure properly if placed in cold molds.

Individual Vulcanizers

The introduction of the individual vulcanizer for tubes and casings has presented new applications for instrument control. For most efficient performance it is necessary that this form of vulcanizer be operated under the control of suitable instruments.

Each type of vulcanizer requires a different form of control system, and it is the purpose here to present in a general

way some of the results which have been accomplished along this line.

In the case of the individual inner tube vulcanizer, the temperature of the mold is controlled by maintaining steam in the jacket of the mold at some fixed temperature. Several vulcanizers are connected to one steam header and so arranged that the molds are always at the curing temperature. The reduction of curing time which this type of vulcanizer makes possible over other methods necessitates that the element of time accurately be controlled. Recognition must be taken of this fact in performing the various opening and closing operations.

When operating this type of vulcanizer manually, considerable time is expended in performing the closing operations, and there is no definite control over the duration of the curing period, which is represented by the time the press is in a closed position.

The four closing operations consist of releasing air from the mold air cylinder which permits the cover to close, locking the cover by operating a so-called breech lock, inflating the diaphragm to register properly the upper and lower molds, and finally to inflate the tube. These operations are performed in the reverse order when the press is opened: the tube being deflated first, the diaphragm underneath the lower mold next, the breech lock opened, and finally the admission of air to the opening cylinder.

Figure 4 shows the "National" type of individual tube vulcanizer with the time cycle regulator applied to it.

The instrument developed for controlling automatically this form of press has been termed the "Time Cycle Regulator" and it is capable of functioning with a high degree of accuracy. It performs these various operations automatically and assures reproducibility of vulcanizer operation within 2 seconds, for 6-, 7-, and 8-minute cures. Its design is such that air is admitted to the tube within 3 to 4 seconds after the operator closes the vulcanizer. The opening of the vulcanizer takes place in 12 seconds, and the tube is completely exhausted when the mold opens.

The operator does not set the instrument; the vulcanizer instantly closes when he pushes down a lever. Subsequent operations then are performed automatically, and the instrument stops when the vulcanizer opens for removing the tube. It is then in readiness for the next cure. This system of control has also been developed for the "Kuhlke" type of individual tube vulcanizer.

Originally the early installations of this type of vulcanizer were arranged for hand operation. Within the past year the time cycle regulator has been almost universally adopted because of the increased production which its use makes possible.

A system of control using the time cycle regulator has also been developed for the "De Mattia" individual vulcanizer for casings and is shown in Figure 5 with the vulcanizer open. In common with the individual tube vulcanizer the jacket surrounding the mold is constantly filled with steam at a definite pressure. It follows, therefore, that the extent of the cure depends largely on the length of time the hot molds are in contact with the tire.

One other factor affecting the quality of cure is the internal pressure treatment given the curing bag. This system controls these operations and is applicable for the various bag heating methods in use. The advantages derived from a system of control of this type seems beyond question, insuring as it does against nonuniformly cured tires.

The operation of the time cycle regulator on the "De Mattia" vulcanizer is entirely automatic. The only manual operation required is a movement of a lever by the operator. In this way the mold is made to start to close, and subsequent operations take place without attention from the operator. After the upper and lower halves of the mold meet and are locked in their closed position, the cycle of the cure begins. At this instant pressure is admitted to the curing bag. If desired, steam can first be circulated or dead ended for a quick heating effect for a definite period. Hot water then can be circulated for the remainder of the cure and finally drained to an atmospheric discharge or to a vacuum line. In this respect the equipment lends itself to the existing diversified practices of curing bag treatment; this schedule is only typical of what can be provided.

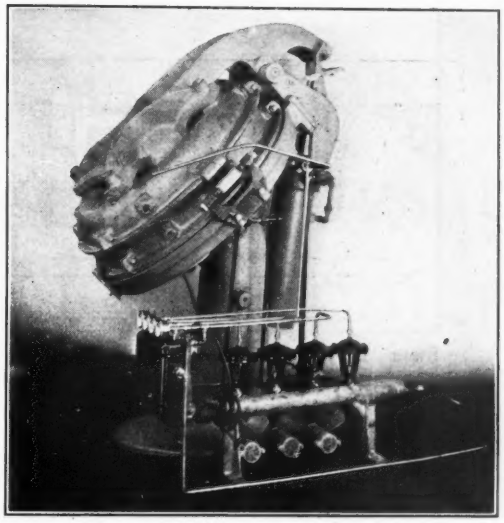


Fig. 4. Time Cycle Regulator Applied to "National" Individual Tube Vulcanizer

At the end of the cure the vulcanizer opens automatically, and the tire is ejected from the mold. Of special interest is the fact that the vulcanizer is at all times locked in its closed position while pressure is in the curing bag. This is accomplished with a positive interlocking pressure device and constitutes a safety feature of great importance.

Compressed air is the motive power by which the time cycle regulator controls the flow of air for operating the individual tube vulcanizer and hydraulic and steam pressures used in connection with the individual tire vulcanizer. The timing element or clock is actuated by a synchronous electric motor.

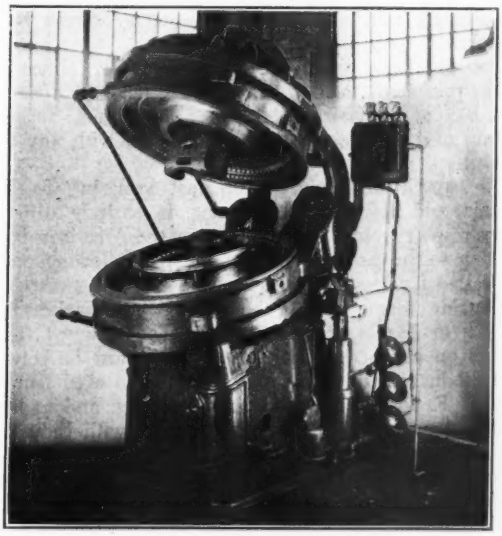
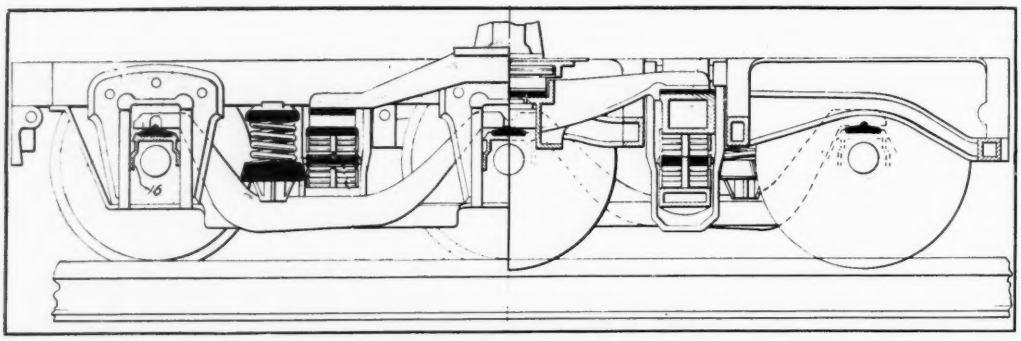


Fig. 5. Time Cycle Regulator Applied to "De Mattia" Individual Tire Vulcanizer



Standard Pullman Six-Wheel Trucks Running on Rubber. (The Rubber Pads Are the Heavy Black Shaded Parts.)

Rubber Heels on Passenger Cars

The Former Rubber Car Spring Returns in New Form as a Shock Absorber on Pullman Car Trucks

Rubber as a shock absorber in the form of heavy cylindrical springs for railway cars was so generally used in the early years of the rubber industry that a certain mechanical rubber company, now defunct, used the words "Car Spring" as part of its name.

While rubber for car spring purposes was supplanted long ago by spiral steel springs, its shock absorbing value, as demonstrated in automotive vehicle construction, has recently brought it back again in railway passenger-car construction. Now it appears that rubber is being used as anti-vibration pads on the trucks wherever metal touches metal.

This innovation is found on standard Pullman six-wheel trucks used under Baltimore & Ohio passenger cars. The locations of these pads are indicated by the eleven black rectangles shown in the illustration. Each truck has fifty-one rubber pads placed where the frame rests and at spring ends. The passengers in a coach thus equipped actually ride smoothly on rubber over polished steel rails with entire freedom from jolts and vibrations arising from rail joints.

Squash Rackets Balls

American and English Types Vary Widely and Should Be Standardized

THERE is a remarkable discrepancy between the American and English squash rackets balls. The American ball is comparatively large and heavy, and it is impossible to compress the walls with the fingers to any marked extent. This is due to the rigidity offered by the walls and not to air pressure inside. The United States Squash Racquets Association specifications are as follows:

Outside diameter, 1¾ inches; weight, 1 ounce. It is black, pneumatic, and should have a rebound upon a concrete base at a temperature of 72° F. of 32 to 33 inches from a drop of 100 inches. It is not inflated with any kind of pressure.

The specification drawn up last year by the English Tennis and Racquets Association is entirely different in every respect from that called for in the American ball. According to the English specification the following properties are called for:

Outside diameter, 1 9/16 to 1 10/16 inches; weight, 23.328 to 24.624 grams; bounce, when dropped from 100 inches on a concrete floor, the bounce must be between 36 and 38 inches; the balls to be kept in an even temperature of 60° F. for twelve hours before testing, and to be tested at this temperature; inflation, fingering with light pressure should be sufficient almost to touch the opposite wall.

It is apparent that the ball called for here is entirely different from the American product, and it seems rather ridiculous that this should be so. Is it not possible for some compromise to be arrived at, whereby the same ball is used in America and Europe?

Counting Rubber Goods

Small Molded Articles Counted by the Action of Light

A NEW device announced by the General Electric Co., Schenectady, N. Y., has much significance to modern industry where mass production is involved. The interruption of a beam of light controls the operation of machinery by utilizing the photo-electric relay. The new relay is essentially a vacuum tube device and uses both the new photo-electric tube and the pliotron.

Among the many applications in which this device may be useful is in counting bags or boxes of material. As each item passes through the essential beam of light, it will cause the photo-electric relay to operate and actuate a magnetic counter.

This system of counting output would seem capable of wide application including many places in the rubber industry where mass production is centered on such items as heels, packages of friction tape, jar rings, nipples, balls, and all molded articles that require to be counted in large numbers.

Among the advantages resulting from the use of this new industrial tool may be named the following:

Operates without resistance to the movement of the object which actuates it, or without impairing the accuracy of delicate mechanisms; Located remotely from the equipment controlled, thus permitting mounting in small spaces around automatic machinery; Adjustable in sensitivity; Used outdoors by mounting in a watertight enclosing case; Easily installed, and its operation easily adjusted or changed; Operated at high speeds, 100 times a minute being an approximate maximum.

The Application of Anti-Friction Bearings to General Plant Equipment

L. M. KLINEDINST[1]

IT IS probably true that the most spectacular results of anti-frictionizing rubber plant equipment are those obtained in the case of the process machines. Another class of plant equipment, however, even if the unit improvement is not so readily apparent, nevertheless offers a very fertile field for the anti-friction bearing. This class comprises what may be called accessories, for lack of a better term, and includes such things as material handling equipment, line shafting, gear drives, motors, and similar odds and ends. Every rubber mill has some examples of it; some of them have large quantities, and all of it is a potential source of extravagance or economy in plant operation, depending largely on the bearings with which the individual devices are equipped. If the foregoing statement seems rather broad and sweeping, even a casual examination of the character of most accessories will show that it is justified. Nearly all of them are primarily friction loads of varying degree, and many incorporate hundreds or even thousands of bearing surfaces that can and do get into trouble.

It might be said, as an introduction, that power saving, while it is of interest, is likely to be the least important benefit arising from the application of anti-friction bearings to such equipment. Probably the most important are: first, the assurance of continuity of service; second, the reduction in lubrication expense; and third, the reduction in maintenance. In the case of most equipment of this sort, but especially of material handling equipment, which forms the bulk of it, the individual power increments are so small that even a high percentage of saving would hardly make an appreciable dent in the plant power bill. That sort of thing is better left to the heavy duty equipment. But continuity of service is of vital importance, so much so in fact that the statement hardly needs elaboration. And the expense, both for the lubricant and the time required to apply it, often can, and does, form a noticeable item of operating cost in the average plant. The same can also be said of maintenance generally, but here there is the further consideration of the trouble and waste caused by the outages that inevitably accompany maintenance. How the application of anti-friction bearings to individual classes of equipment affects these factors can probably best be seen from an equally individual discussion of them.

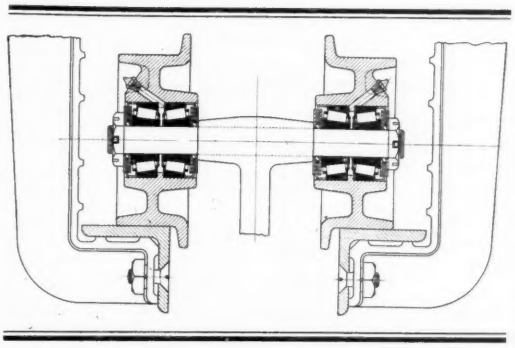


Fig. 1. Typical Layout for Overhead Conveyer Wheels, Showing How Escape of Lubricant Is Prevented

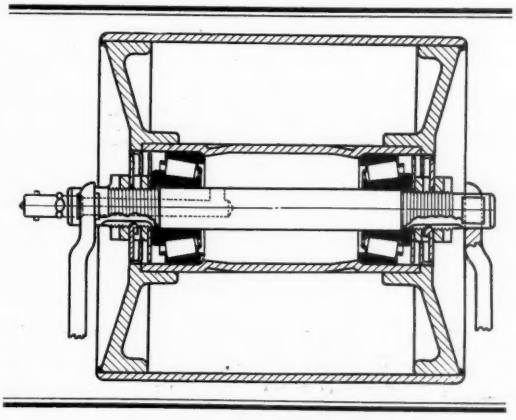


Fig. 2. Belt Conveyer Mounting, Showing Liberal Provision for Lubrication

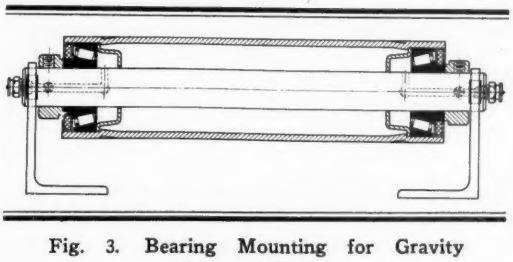


Fig. 3. Bearing Mounting for Gravity Conveyer Roller

Material Handling Equipment

The plant handling equipment of the average rubber plant can be made to fall into two general categories: conveyers and shop trucks; and the former can be subdivided into overhead, belt, pan, and gravity conveyers. Mountings involving the use of anti-friction bearings for all four classes have been developed and have proved quite successful in service. They are principally characterized by their simplicity and compactness, by the care taken to simplify the lubrication problem, and by their cheapness. The latter is an important factor when the number of bearing surfaces in the average conveyer is taken into account; if the mountings could not be made inexpensively, they would be impractical. As to the results obtained by the use of these mountings, it is enough to say generally that they are very beneficial, for different reasons in the case of different types of conveyers.

The overhead conveyer seems to be becoming increasingly pop-

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ular for rubber plant service. Several types of bearing mountings have been developed for the wheels used on such conveyers, but the one shown in Figure 1 is sufficiently typical to serve as an example of the arrangement used. In this case the bearing cups or outer races are pressed into the wheel hubs, and the cones given a light fit on the shaft. Adjustment is obtained by the nut on the end of the shaft and, once set, is locked by a cotter pin. The closures are simple but are designed with a view to preventing any escape of lubricant and to excluding any foreign matter. Storage space for an ample supply of reserve lubricant is provided. Such a mounting is quite inexpensive, but at the same time it adds considerably to the performance of the conveyer. In the first place there is no trouble or damage from dripping oil to any perishable material that the conveyer may be carrying. Secondly, the wheels are held rigidly in alinement; consequently they do not wabble to hasten either tread or track wear. Lastly, both lubrication and maintenance expense, to say nothing of power consumption, are but hollow mockeries of their former selves.

A typical mounting for a belt conveyer idler is shown in Figure 2. In this case the mountings are somewhat more elaborate as might be expected considering the difference in the service, but they are still comparatively inexpensive. The cups are pressed into a tube, which carries the body of the roller, indentations in the tube serving as shoulders to locate them. The cones are loosely fitted on the shaft to permit a certain amount of creepage. Adjustment is obtained by lock nuts on each end of the shaft. The whole interior of the tube is available as a storage reservoir for lubricant; hence frequent renewals are not necessary. The closures are simple but they meet the requirements as to the retention of lubricant and exclusion of foreign matter quite effectively. As to results, it has been found that the power demand for conveyers equipped with this or similar mountings is about half of the ordinary demand, and the lubrication expense about 90 per cent less. Also, maintenance is correspondingly reduced; for one thing, there is no danger of bearings seizing and causing the roller to wear spots on the belt. Of course fullest advantage of these benefits is obtained only when the whole conveyer system, that is return idlers, head, and tail pulleys, are anti-frictionized as well as the belt idlers; but this is the rule rather than the exception with belt conveyer installations. The mountings for the other members are very similar to that just described.

In designing the mounting used on the rollers of gravity conveyers, the principal factor in mind was cheapness. Such a mounting is shown in Figure 3. In this case the roller proper is indented at each end to provide locating shoulders for the bearing cups and the grease retainer, which are pressed against them. The bearing cones are given a light fit on the shaft, and the whole assembly locked into place by a retaining ring, which is in turn locked by a set screw. As can be seen, the closures, both outer and inner, are exceedingly simple. One of the principal operating advantages of this mounting is directly traceable to the uniform coefficient of friction that characterizes tapered roller bearings in comparison to the variations in the coefficient of plain bearings under different conditions of lubrication, load, or velocity of the load. As a result, conveyers can be designed with a definite angle of drop to produce a given velocity of the load without trouble from jams or from excessive velocity due to changes in the coefficient of friction. Furthermore, as usual lubrication and maintenance expense is greatly reduced.

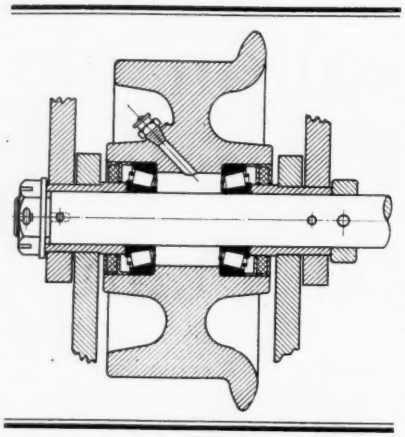


Fig. 4. Bearing Mounting for Pan Conveyer Wheel

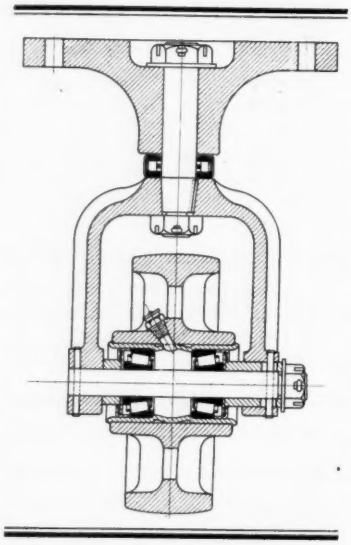


Fig. 5. Bearing Mounting for Industrial Truck Wheels

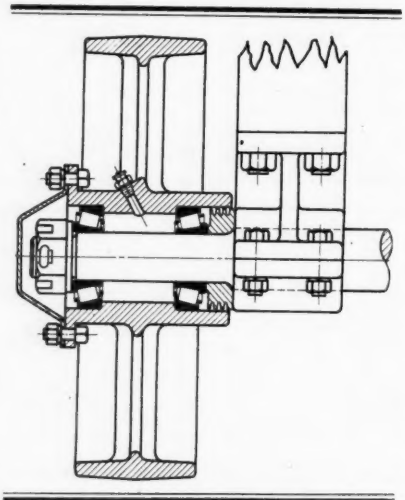


Fig. 6. Wheel Bearing for Industrial Trucks with Fixed Axle

Pan conveyers are so little used in rubber plants that a detailed description of the bearing mountings is hardly appropriate. Figure 4 shows one of them, which as in the others is notable for simplicity and effectiveness. The advantages of such a mounting are also more or less duplicates of those already outlined.

In the case of shop trucks the situation is quite different, as they do form an important part of the material handling system of many plants. Several types of mounting, which vary considerably according to the type of truck and the service to which it is put, have been developed for this service. Two types are shown herewith, in Figures 5 and 6 respectively, the former being a caster wheel and the other a wheel mounted on a fixed axle. Aside from the caster swivel bearing, which consists simply of a tapered roller thrust bearing mounted on the swivel pin, the two mountings are very similar. The bearing cups are pressed either into a cartridge or directly into the hub, as the case may be, and the cones are given a light fit on the axle or spindle. The bearings are cone adjusted by a nut on the end of the spindle, in one case bearing on a spacer ring (Figure 5) and in the other directly on the cone (Figure 6).

Closures are very simple, and ample space is provided for adequate reserve lubricant storage. One of the features of these and similar mountings is the permanent rigidity that is imparted to the wheel and axle assembly by the lasting qualities of the bearings. In consequence cases of loose or wabbling wheels causing accidents and destroy-

ing floors never occur. As a matter of fact in one large rubber plant where a record was kept of the expense for floor maintenance, it was found that $30,000 was saved in this one item alone by an installation of tapered roller bearing-equipped trucks. Such trucks are much easier to handle and cost much less to keep in proper working condition.

Power Transmission Equipment

Of the different types of equipment included in this classification, the one of greatest interest in rubber mills generally is probably line shafting supports, either pillow blocks or line shaft hangers. Usually these can be purchased already assembled from various manufacturers so that it is hardly necessary to go into the details of their construction. For reference, however, a typical pillow block mounting is shown in Figure 7. The most interesting feature of this equipment is its effect upon operating characteristics, both practical and economical, especially in connection with the grouping of heavy duty machines. In one case on record, where a number of mixing machines were being driven in a line, it was found that applying roller bearing pillow blocks to the line shaft effected a saving of 10 per cent in the overall power demand of the machine line. For another thing, shaft alinement is more or less permanently preserved; that is a rather important feature, considering that the machines of the group are usually gear driven from the main shaft. In the case of lighter machinery, that is belt driven from overhead shafts, the shaft alinement guaranteed by tapered roller bearing hangers is still important because it postpones belt wear and saves some wear and tear on the driven machines themselves.

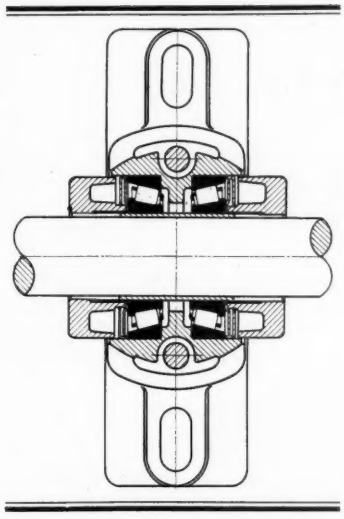


Fig. 7. Method of Mounting Pillow Block Shaft Bearings

As to gear drives, which also come under the head of power transmission equipment, bearing mountings have been developed for practically every type of gear extant. For example, Figure 8 shows the arrangement used with plain or spur gears. The bearings for both gear and pinion are mounted in cartridges, the bearings being set up in the cartridge before assembly in the unit. The cartridges are then inserted into the housing and pinned against rotation or lateral movement. In the case of the mounting for worm gears, shown in Figure 9, the problems encountered are not quite so simple, and consequently the mounting is somewhat different. The principal difference comes in the mounting of the worm shaft; the wheel shaft mounting is quite conventional. In the former, however, some provision must be made to take care of shaft expansion arising from the imperfect dissipation of the heat generated during operation. This is done by permitting the bearing at one end of the shaft to float in the housing, while that at the other end is fixed, as can be seen from the illustration. In the case of helical gears, a certain amount of float is also permitted, usually in the pinion shaft, to permit the gear and pinion to line up properly. The characteristics of helical gear mountings are also slightly different owing to the necessity of taking care of thrust reaction loads caused by the pressure of the teeth. The principal advantage of these gear unit mountings is the preservation of shaft alinement which they insure. Consequently, tooth wear is indefinitely postponed, and back lash with consequent transmitted shocks to the driven machinery is practically eliminated.

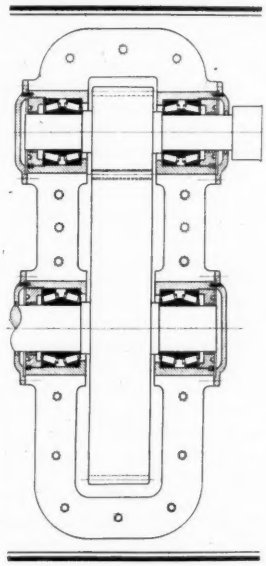


Fig. 8. Bearing Mounting for Spur Gear Drive

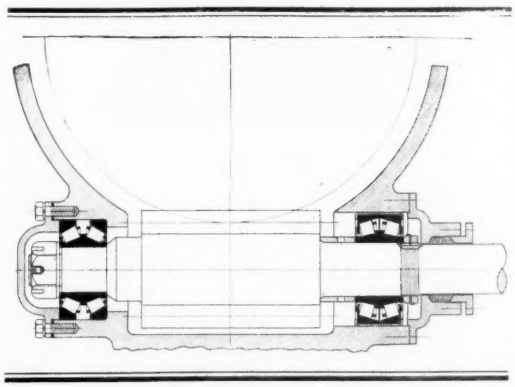


Fig. 9. Bearing Mounting for Worm Gear Shaft, Showing Provision for Shaft Expansion

Motors

The application of tapered roller bearings to electric motors is a comparatively new development but, judging from the rapidity of its growth, a very successful one. The mounting is quite simple; in fact it hardly needs detailed explanation. The principal advantage of the bearings in this particular case is the assurance they give of continuity of service from the motors. As a rule about the most expensive motor troubles are those arising either directly or indirectly from bearing failure; with this eliminated motor maintenance and outages are very much reduced. In addition, there is a material revision downward in the expense for lubrication.

Tapered roller bearings are used also in many other classes of equipment which find employment in the production of rubber. Among these may be listed pumps, compressors, ventilating fans, and machine tools of various sorts. The mountings follow the same general details of those already described, although in each type of equipment they are arranged to meet certain definite mechanical requirements. In pumps, for example, the bearings are mounted with an especial view to maintaining shaft rigidity, since, particularly in centrifugal pumps, clearances are very close. Also, in reciprocating pumps it is highly desirable that the proper relations be maintained between moving and stationary parts.

Much the same considerations apply to compressors, since, generally speaking, they operate on the same principles and have the same mechanical requirements as pumps, with the additional feature that speeds are likely to be higher. In machine tools the most important requirement, and one that has done much to encourage the use of tapered roller bearings, is spindle rigidity. Both tests and experience have shown that rigidity is increased by their use.

Generally speaking, the benefits obtained from these bearings are uniform with those already outlined. Power is saved, and the effective life of the machines is increased at a lower expense for lubrication and maintenance.

Pajama Ensemble No. 39

Style for Bathing Accessories

The Ensemble Trend Influences Caps and Slippers for Beachwear

STYLE reigns supreme. It is ever the dominating note in all smart costumes. None can escape it—no, not even seashore and bathing apparel. Yet never before has style played so important a part in accessories for the beach. Sophistication is evidenced by the stunning lines of the turban or the saucy tilt of a beret, by the high-heeled footwear, and by the gay stripes of picturesque blazers. Rubber, besides being serviceable, is rendered truly beautiful by its enchanting finishes in scintillating metallics, attractive moires, and gorgeous mottletones. Motifs range from dainty floral patterns to the daring angles and bizarre splashes of ultra-modern art. Of primary importance is color harmony to include even cap, belt, shoes, and in many cases a rubber scarf. For always the ensemble commands attention.

An alluring pajama ensemble, *le dernier cri*, in beach togs, is here illustrated. Who could resist this swanky suit with its striped trousers of red and white, blue and white, or green and white, and the beautiful smock and the neat jacket to harmonize? A cap and shoes to match also are available.

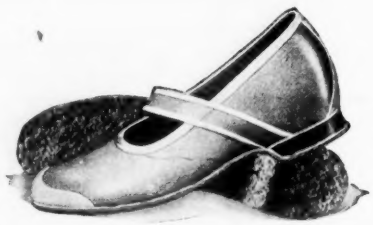
One of the most popular creations heralded this season is the French beret. It, of course, is offered in the same material and in colors to correspond with the bathing shoes. Some of the caps are plain in solid tones or with a spider-web design (see No. 970); while others are made in cut-together triangles of red, blue, black, or green alternating with white. Besides these plain models, berets are to be had also with a bit of trimming or in two-tone or mottled effects. A dainty number, in a crinkly rubber, claimed not to stick to the hair, may be procured in solid colors or with a multi-hued star inserted on top.

Pastel shades predominate. The preference for colors, as indicated by current sales, runs from suntan, green, iridescent, blue or red to white and black. The last, it must be confessed, receives very few calls these days. The two-tone vogue and other color combinations are very effective with headwear as well as with footwear.

As swimming and diving, moreover, find increasing favor with women, the latter want caps that will keep their crowning glory from getting wet. That accounts largely for the heavy demand for aviators and divers. These are presented in a grand array of designs, finishes, and colors, a few of which are pictured. One of the most attractive is No. 1596, a molded cap, aviator or diver, with a delicate feather motif that comes in many colors including red, blue, black, green, white, suntan, and purple. Some have the metallic finish so favored this season. A somewhat similar model, aviator or diver, is No. 1593, which bears a natty anchor design and, with the exception of purple, is made in the same shades as No. 1596. Another fetching aviator cap is No. 1598, consisting of a shell pattern with large scalloped shells forming the ears. A radiant sunburst on each side enhances the appearance of cap No. 1590. The last two aviators come in the same colors as No. 1593. The Royal decorated aviator, No. 910, of a fine spider-web tracing in which is inserted an occasional triangle, also appears in the aforementioned hues with shoes to match. Certain models with their surface designs permanently embossed reveal a moire or brocade finish giving the caps more the look of silk or satin than rubber. Then, other aviators and divers flaunt a touch of trimming to relieve their tailored severity.

An innovation in bathing caps is a patented model whose distinguishing feature is the specially designed channels on the inside band, to keep water from hair and ears. The single and the double row of the sawtooth channel design allow for ventilation but do not mark the forehead. Repeated diving tests have demonstrated that the cap is watertight. As fitting is important, directions for putting on the cap are molded inside. It is made in two sizes, Nos. 1603 and 1604, in standard colors with a lightning motif.

No. 970



No. 96

No. 1596

Even among children is the use of the aviator or the diver cap widespread. No. 1600 is a junior molded aviator upon which is represented a water scene with a girl diving from a springboard. Six new chicken novelties above the band will delight the kiddie who sees the diver No. 3070. Another strapped helmet for the much younger set is decorated with a host of birds on the wing. The colors chosen for these caps include red, blue, green, canary, suntan, black, and white.

With the trend toward serviceable caps, such as divers and aviators, the elaborate marine millinery with its huge bows and garden-variety ornaments so popular a few seasons ago is losing favor. But, you will recall, as soon as a girl swimmer emerges from the water, she yanks off her diver or aviator. For no matter how attractive the wearer is, the extreme severity of the close-fitting cap rarely is becoming. Consequently if she wants merely to sit around the beach or go strolling in her bathing togs, the ultra-modern miss has another cap, far more flattering. Thus the beret.

No. 3059

Other novelties likewise vie for milady's pleasure. A captivating creation that has appeal in these days when femininity in fashions prevails, is the turban, one model being among the illustrations. Note the smart lines artistically draped to the fringed tassel in front. Mottled stock in red, blue, green, and black increases its charm.

The influence of the navy, furthermore, is keenly felt. A dashing rubber yacht cap with regulation visor and cord has won approval. The gob cap, that is the white middy hat sported so jauntily by our sailors, also has captured feminine fancy. Of calendered stock in gay colors, with its wide upturned brim that may be twisted into chic lines, the gob cap is a natty piece of headwear. It may be obtained in all white or with a star pattern on top with each point in one of the following shades: orchid, green, yellow, red, blue, and black. The narrow border on the brim, too, is in one of the those colors, which are matched with dainty footwear.

The hills of Scotland lend a bonny plaid on a white background for a close-fitting cap known as Sassy. In the same plaid a long narrow scarf fitted at the back of the neck supplies an effective finishing touch.

Head-shaped molded caps similar in design and shape to felt hats for street wear enjoy a following. Present-day bathing wear is modern millinery in rubber.

From the top of her adorable head to the tip of her tiny feet, the bathing beauty is fetchingly garbed. Having considered her headwear, let us now devote our attention to her footwear. Have you ever noticed girls in heelless bathing slippers as they meander about? Why, they're on their toes. Of course. Being accustomed to high heels for everyday wear, women naturally find shoes with heels uncomfortable. So while walking in them, milady instinctively bends forward on her toes. When she is ready for a dip, she frequently kicks off the offending members, partly because of their lack of comfort and often

The "Chic" Shoe

because, being too large for her, they slip off and are lost as soon as they become filled with water. It is well to remember that rubber bathing shoes should be worn in a smaller size than ordinary footwear.

When the bathing slipper with a heel was first introduced, its appeal was widespread. Nor has time dimmed its popularity. Heights vary from the flat heel, like children's, to the medium heel of average height, and the high heel itself. Thus fashioned after street shoes, bathing footwear may be procured in many attractive models. For those who prefer straps, a variety of good-looking types is available. Then, too, the opera pump is always pleasing. As for bows, the choice is bewildering. Perhaps an oxford is wanted? That may be had.

Two attention-arresting numbers are shown. The "Chic" shoe has a pump vamp with an extra-high heel. The colors include red, blue, green, black, white, suntan; and also green, blue, rose, silver, gold, and iridescent pearl to match caps in the new metallic finish. No. 96 also will tempt the most fastidious woman. The pump boasts a neat strap, a low heel, and a crepe sole. Fashionable shades are blended here to add a swanky note to the shoe.

Furthermore, the bathing girl is offered slippers for promenading or to complete her pajama costume as well as for general sportwear. A Roman sandal with a red ribbed rubber sole and colored thongs for fastening is a novelty not to be ignored. Rubberized satin in the latest hues makes a shoe well adapted for walking, with its wooden Cuban heel and black serviceable sole of tire tread stock. One type of slipper is copied from those worn by waiters along the Riviera. Another model, of canvas flaunting vivid stripes, with its rubber sole and heel also is practical. Rubber-soled linen shoes that may be used on the tennis court as well as at the beach likewise deserve consideration. It should be realized that all these shoes, besides harmonizing

No. 1603

with the cap and the bathing suit, also match coats, capes, or jackets worn over the suits. Thus the ensemble is complete.

The style appeal influenced by the ensemble vogue is one few women can or want to resist. In the matter of beach wear they are as particular as with their more formal attire. It seems a certainty, moreover, that the accessories here pictured and described will find a wide market. For they will please and flatter women—and what could be more important than that?

We are indebted to the United States Rubber Co., New York, N. Y., for the illustrations used in this article.

No. 1593

No. 1600

Sponge Rubber Manufacture

A continuation of the article published in INDIA RUBBER WORLD, *April* 1, 1930.

Hard Cellular Rubber

SPONGE rubber is ordinarily made by placing the blank in a mold having a volume greater than its own, applying heat, and allowing the stock to swell and fill the cavity. This method does not always give sharp outlines particularly when the stock is sulphurized for making hard cellular rubber, and if the blank is made broad enough in one plane to fill out to the sides of the cavity before reaching the top of the cavity, the top surface will present a wrinkled appearance in the finished article.

In the process described in U. S. Patent No. 1,515,475, November 11, 1924, to Goodwin, a blank of sponge rubber stock having the same dimensions as the mold, is placed in the bottom of the cavity, and a floating plate placed upon it so that the stock fills the molding cavity. The cover is then applied, the mold placed in a vulcanizing press, and heat applied, or the mold may be clamped together and placed in open steam, causing the gasifying substance in the stock to expand it. The floating plate rises until it meets the cover plate and the vulcanization then continues at fixed volume, the floating plate serving to form a smooth top surface on the finished article.

The following abstracts comprise an interesting survey of the United States patents relating to sponge rubber manufacture.

Abstracts

1. Moulton, 94,631, Sept. 7, 1869. Inking roller of sponge rubber has a coating of solid rubber.

2. Chesterman, 97,880, Dec. 14, 1869. Sponge rubber mixture comprises rubber, soda, alum, and molasses.

3. Colburn, 153,666, Aug. 4, 1874. Sheets of sponge rubber are reenforced with layers of cloth.

4. Slazenger, 399,940, Mar. 19, 1889. Coin mat is made of sponge rubber.

5. Belden, 467,245, Jan. 19, 1892. Tire has a solid outer portion and an integral inner portion of sponge rubber.

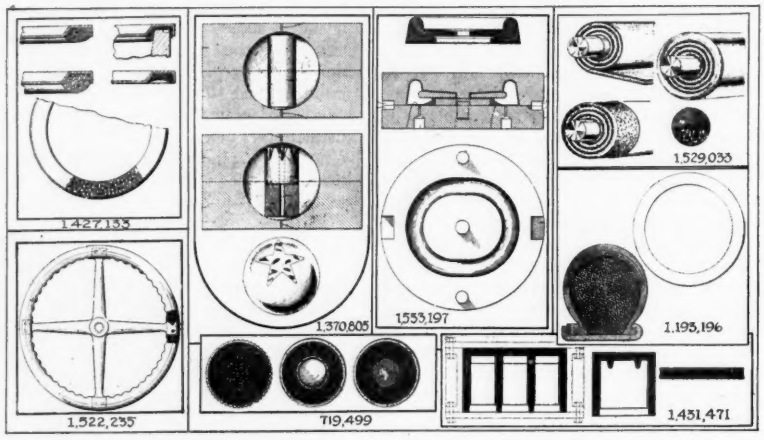
6. Pratt, 549,016, Oct. 29, 1895. Tire comprises a tubular outer portion of hard rubber, a core of sponge rubber, and a tubular casing of canvas for inclosing the core within the outer portion.

7. Elwell, 567,459, Sept. 8, 1896. Ball is composed of a hollow shell of sponge rubber, one of the continuous, spherical surfaces of the shell being impervious to air, the sponge rubber forming a backing to resist puncture.

8. Scotford, 578,527, Mar. 9, 1897. A molded blank for sponge rubber type bases comprises an integral strip of sponge rubber, provided with parallel grooves molded in a blank and affording finished surfaces on all edges of the type bases cut from the blanks.

9. Day, 690,241, Dec. 31, 1901. Pad for inking printing films consists of two spaced metal plates and sponge rubber.

10. Strause, 702,162, June 10, 1902. Incorporate paraffin with rubber, heat the compound to form cells, and vulcanize the rubber.



11. Painter, 719,499, Feb. 3, 1903. Ball comprises a solid core of sponge rubber of one or more pieces around it, and a cover over the core holding it under tension. (See group illustration).

12. Rodman, 720,741, Feb. 17, 1903. Making porous, electrolytic diaphragms consists in mixing together crude rubber, sulphur, and potassium sulphate, molding and vulcanizing the mixture, and subsequently dissolving out the potassium sulphate.

13. Derick, 752,147, Feb. 16, 1904. Mattress comprises a plurality of layers of sponge rubber surrounded by a covering of textile fabric; each layer consists of a plurality of slabs with abutting joints, the slabs of one layer being arranged so as to break joints with those of the next succeeding layer.

14. McIntyre, 897,920, Sept. 8, 1908. Sponge rubber cushion for shoes has integrally combined therewith thin surface layers composed of rubber impervious to air.

15. Poizot, 963,806, July 12, 1910. Mix together rubber, ammonia, and sulphur to form a homogeneous paste, and then vulcanize at 135°C.

16. Pfleumer, 1,038,950, Sept. 17, 1912, Reissue No. 13,667. Hot vulcanized sponge rubber is kept under high gas pressure so that the gas penetrates the structure of the material until it is cooled; afterward release the gas pressure.

17. Willis and Felix, 1,045,234, Nov. 26, 1912. Artificial sponge is made by subjecting sponge rubber to cooperating rollers to break down the cell walls.

18. Laarmann, 1,089,482, Mar. 10, 1914. Elastic foam is made from a solution of an elastic material by placing the solution in an air-tight vessel, hermetically closing it, turning the solution into a foam, fixing it by bringing a vulcanizing agent into contact and intimately mixing it with the foam, opening the vessel, and evaporating the dissolving medium.

19. Huebner, 1,103,359, July 14, 1914. Sponge rubber is produced by admixing with rubber successively at different intervals resin oil, zinc oxide, turpentine, flour of sulphur, and ammonium carbonate and vulcanizing the mass in a mold by placing it into a vulcanizer and admitting steam at intervals at successively higher temperature to increase gradually the temperature of the compound until 35 pounds' pressure is attained, and maintaining the pressure for 1 5/6 hours.

20. Schidrowitz and Goldsbrough, 1,156,184, Oct. 12, 1915. Rubber latex is coagulated under conditions producing a porous or spongy coagulum, and the pores fixed by vulcanization of the wet coagulum by agents which are added at any suitable stage of the process.

21. Roberts, 1,173,538, Feb. 29, 1916. A typewriter pad is made of sponge rubber under strong lateral compression.

22. Sherbondy, 1,193,196, Aug. 1, 1916. A composition comprises raw rubber 34 pounds, infusorial earth 14 pounds, rosin oil 1 pint, flour of sulphur 4 pounds, air slaked lime 4 ounces, carbonate of ammonia 2 pounds, baking soda 1 pound. (See group illustration.)

23. Oberfelder, 1,244,236, Oct. 23, 1917. A tube of high grade rubber has a thick strip of sponge rubber vulcanized in the tread region of the tube.

24. Wiegand and Rieder, 1,249,702, Dec. 11, 1917. A shoe embodies an upper, a rubber tread having lateral portions of rubber forming part of the tread extending upwardly upon and secured to the upper, and a sponge rubber cushion between tread and upper.

25. McElroy, 1,262,532, Apr. 9, 1918. A golf ball of sponge rubber has a thin, imperforate skin.

26. Oldham, 1,286,396, Dec. 3, 1918. A boxing glove has a padding of sponge rubber.

27. Bubb, 1,309,507, July 8, 1919. A valve for flush tanks is made of sponge rubber.

28. Ellis, 1,332,169, Feb. 24, 1920. A rubber type stamp is made by uniting two strata of unvulcanized rubber compounds, one stratum being suitable for making the type face of a rubber stamp, the other stratum being impregnated with a material adapted to assume gaseous form upon the application of vulcanizing heat.

29. Repony, 1,341,673, June 1, 1920. A friction clutch has engaging faces comprising sponge rubber.

30. Wedlock, 1,345,046, June 29, 1920. A heat insulating fabric consists of a body portion of sponge rubber and a strengthening material of a woven fibrous texture over the exposed surface.

31. Wishart, 1,345,904, July 6, 1920. Sponge rubber articles are made by forming a composition of rubber, sulphur, ammonium carbonate, zinc oxide, and magnesium oxide, placing the composition in a perforated mold, and vulcanizing.

32. Flemming, 1,370,805, Mar. 8, 1921. The method consists in placing within a mold cavity having oppositely disposed vents a block of sponge rubber material with the central passage in communication with the vents and thereafter subjecting the block to vulcanizing heat. (See group illustration.)

33. Fulton, 1,385,044, July 19, 1921, Reissue No. 15,957. The rubber and the activated carbon are mixed subjected to the presence of gas, vulcanized, allowed to cool, and finally the material is heated causing the particles to give up their occluded gas, forming in the material a multitude of non-communicating cells.

34. Gordon, 1,398,685, Nov. 29, 1921. This covers a sponge air filter.

35. Miller, 1,409,059, Mar. 7, 1922. Sponge rubber balls are made by forming a plurality of sponge rubber sections which form a ball and then permanently uniting the sections.

36. Naylor, 1,418,825, June 6, 1922. Sponge rubber is made by incorporating phenylhydrazine in the rubber mix prior to vulcanization, and subjecting it to heat.

37. Ostberg and Kenny, 1,422,884, July 18, 1922. A process for the manufacture of a spongy rubber material comprises mixing together 15 pounds Para rubber, 15 pounds reclaimed rubber, 13 pounds sulphur, 9 pounds zinc white, 1½ pounds carbonate of magnesia, then adding a volatile mineral oil to soften the rubber ingredient, and vulcanizing.

38. Taliaferro, 1,427,133, Aug. 29, 1922. A hermetic sealing member for containers consisting of a plastic rubber base having spongelike cells throughout the inner body portion. (See group illustration).

39. Gibbons and Ritter, 1,427,754, Aug. 29, 1922. A pliable transpiratory sheet material is produced by making a sheet of fibrous rubber and incorporating a vaporizable liquid therein, expelling vapors of the liquid to render the sheet porous, and finally setting the sheet in a pliable porous condition.

40. Lehr, 1,431,471, Oct. 10, 1922, The process of making a liquid container consists in forming a lining of impervious vulcanizable compound and a backing of spongy vulcanizable compound and supporting the lining during vulcanization by a binding of textile material, which eventually remains embedded in the article. (See group illustration.)

Another Rubber Producing Plant

Shrub Brought from Madagascar Stands United States Climate—Produces Rubber of Finest Quality

RUBBER plants of the species *Euphorbia intisy* from Madagascar are growing in southern California and Florida, having withstood the past winter with no apparent damage. These plants were brought to the United States by Dr. Charles F. Swingle, botanist of the U. S. Department of Agriculture, who spent several months in Madagascar with Prof. H. Humbert, University of Algiers.

Madagascar in 1891 ruthless commercial exploitation followed and within a few years intisy had become so rare that specimens were difficult to find.

The manner of obtaining intisy rubber is very simple. The latex, which flows from any cut, coagulates in the air. All that the native has to do is to make cuts in the stem, return in a few days, and pull off bands of rubber of very high quality. The yield of rubber from stems less than one inch in diameter is so slight that it does not pay to tap them. During the time of commercial exploitation, however, spiral cuts were made all the way up the tree, and yields of 15 pounds or more of rubber would be obtained from a single tree. In many cases the first tapping was so severe that the tree died outright.

***Euphorbia Intisy* Growing in Madagascar. Right—Root of *Euphorbia Intisy*.**

Intisy is a shrub or small tree reported to reach a height of approximately 20 feet. The trees are leafless and present a scraggly appearance. Their ability to grow in the very dry regions of southern Madagascar is accounted for by the roots which resemble links of sausage and act as water reservoirs.

With the discovery of this plant in

41. Johnston and Bulley, 1,435,526, Nov. 14, 1922. This consists in covering a form with a layer of hard rubber compound, applying thereto a layer of similar compound containing a blowing agent, and vulcanizing the raw article in a suitable mold.

42. Muth, 1,446,466, Feb. 27, 1923. A toy made from sponge rubber is reenforced by a metal frame.

43. Cleghorn, 1,453,305, May 1, 1923. A self-sealing gas tank comprises a layer of sponge rubber and a coating of Turkish birdlime on the face of the rubber.

44. Harrison, 1,472,521, Oct. 30, 1923. A building element has a hard sponge rubber layer.

45. Malm, 1,484,731, Feb. 26, 1924. Sponge rubber articles are made by placing the composition into a mold with opening for the escape of gases, the composition partly filling the mold, then vulcanizing it, causing the composition to swell and fill the mold and producing within the composition a large number of cells.

46. Frazier, 1,499,166, June 24, 1924. A chair seat pad comprises a body of sponge rubber having a soft non-friction wear surface formed of a layer of felt partially impregnated with a rubber composition.

47. Miller, 1,501,009, July 8, 1924, Reissue No. 16,047. A sponge rubber body is formed by applying to its surface portion a coating of fluid rubber carrying particles of wool flock, applying sufficient additional particles to form a covering, and vulcanizing.

48. Marshall, 1,501,791, July 15, 1924. The process consists in providing a mixture of raw rubber, fluxing material, and vulcanizer, applying a skin of rubber and sulphur compound to the mixture, vulcanizing, subjecting it, while being vulcanized, to the action of an inert gas under pressure causing the gas to penetrate, and then relieving the pressure.

49. Gernsback, 1,514,152, Nov. 4, 1924. This is for a sponge rubber ear cushion.

50. Goodwin, 1,515,475, Nov. 11, 1924. The method of molding sponge rubber comprises contacting the blank on all sides with rigid walls and expanding and vulcanizing it by heat while so contacted.

51. Reina, 1,519,009, Dec. 9, 1924. This covers a sponge rubber insole.

52. Gammeter, 1,522,235, Jan. 6, 1925. Steering wheel has rim having a cellular hard rubber core and a skin of dense hard rubber vulcanized thereon. (See group illustration.)

53. Freedlander et al, 1,523,638, Jan. 20, 1925. Tennis racket has frame, throat members, and a handle molded on the throat consisting of a hard rubber core and a sponge rubber covering.

54. Goodwin, 1,528,107, Mar. 3, 1925. A sponge rubber article having a metal insert is made by forming a recessed blank of sponge rubber stock adapted to receive the insert in the mouth of its recess, and heating the blank in a mold while venting the recess through the insert.

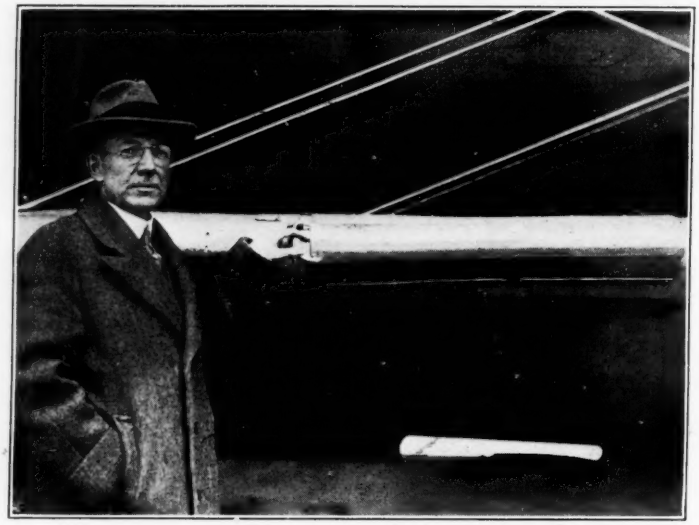
55. Merrill, 1,529,033, Mar. 10, 1925. An inking element is made by producing a body of soft sponge rubber, removing a part thereof, whereby a pitted surface is provided, and applying a layer of gelatin to the surface. (See group illustration.)

56. Malm, 1,533,197, Apr. 14, 1925. Sponge rubber articles are made by forming a composition of smoked sheet rubber, sulphur, ammonium carbonate, barytes, and an accelerator such as magnesium oxide, placing the composition in a mold with openings for the escape of gases, partially filling the mold, and then vulcanizing the composition. See group illustration.

(To be continued)

Ice Hazard Past for Airplanes

Aviation Rendered Safer by Rubber Research Chemist



William C. Geer and His Rubber Overshoe Ice Remover

THE formation of ice on the wings and other parts of airplanes is a source of great danger to aviators in winter flights and at high altitudes, and has proved fatal to many airmen in the past. Studies of means to avoid the ice hazard have been made for nearly three years by William C. Geer in conjunction with Wesley L. Smith, eastern superintendent of the National Air Transport, Inc. Since last September these studies have been sponsored by the Daniel Guggenheim Fund for the Promotion of Aeronautics, Inc., Cornell University, and The B. F. Goodrich Co.

Laboratory studies by Mr. Geer and Merritt Scott revealed the fundamental principles. These have been embodied in the simple practical device here pictured, which was successfully tested within recent weeks. Although the tests were performed on certain parts of the plane only, the principles are adaptable to all those parts from which it is necessary to remove ice.

The three fundamental principles developed in the study of ice elimination are: (1) lubrication; (2) ice does not remove itself from a zero adhesion surface; and (3) a mechanical device is needed to overcome the forces that hold the ice in place, and allow it to fall away.

Lubrication

The proper lubricating oils for reducing the adhesion of ice to a surface have freezing points which fall below 20° F., low viscosities at this temperature, and high boiling points. Such oils are thus mobile liquids under ice forming conditions and are non-drying over long periods of time.

To render the scrubbing off by the wind impossible, the oils are absorbed into thin sheets of vulcanized rubber, which absorb large volumes of many different oils. To avoid the weakening and deteriorating action of oil upon the rubber, a long study of the effect of over 100 oils and oil mixtures on rubber was undertaken, with the result that a mixture has been found which gives to vulcanized rubber an essentially zero adhesion toward ice and which only slightly alters the tensile strength and other physical properties of the rubber sheet. When tested in the wind tunnel, a sheet of rubber into which this oil has been absorbed shows the property of exuding oil to the surface at freezing temperatures, that is, the rubber is self-lubricating and shows this property over a long period after an initial oil treatment.

A sheet of vulcanized rubber has an added advantage: it is one of the best heat insulators, and because of the retention at the surface of the heat of fusion of the freezing mist, the volume of ice formed on a rubber sheet is somewhat less than upon most other substances.

Ice Holds to Zero Adhesion Surface

Ice formed upon a zero adhesion surface does not remove itself. It forms on any surface, perfectly shaped to every irregularity and, like a suction cup, holds on the curved airplane parts by atmospheric pressure. When the plane is in flight, since the ice forms only on leading edges, the air forces equivalent to the flight speed of the plane are added to the atmospheric pressure, and the two forces effectively prevent most surfaces from automatically shedding their ice.

Pneumatic Ice Remover

These observations led to the simple mechanical device pictured. By means of it the ice, particularly in thin layers, can be moved and the "vacuum broken." The device is a light-weight thin rubber overshoe or pneumatic hose for leading airplane edges only, with fabric backing for strength. In the front edge of this overshoe is an air tube, and a rubber oil holding layer is over the outer surface. The inner tube is connected by pressure tubing to a pump, either motor or hand driven. It lies flat on the part with tubes collapsed; thus it alters but little the curvature of the wing or strut. When ice forms, the pilot turns air into the tubes, slightly expanding them. This moves the ice, breaks the vacuum, and since the adhesion to the oiled rubber is essentially zero, the ice becomes loosened on the plane and is blown away.

When flying in an ice-forming region, the pilot will use his air pump while the ice layer is thin. If he waits until the layer is thick, it can be removed, although a little higher air pressure may be required. The expansion of the tube required to loosen the ice is small and therefore the change in aerodynamical characteristics of the wings need be but temporary and slight.

Rubber Dough Anti-Squeak

Rubber dough is a new plastic material used in the assembly of automobile bodies to make them dead quiet originally and to prevent the little squeaks that bodies are prone to develop after a long period of use.

In its original state, as supplied by its manufacturers, rubber dough is a comparatively easy-flowing liquid. When it is applied to the wood or metal parts during the assembly of a body, it spreads evenly over the entire surface. Then, when the body goes through the paint ovens, the rubber solution expands filling every hollow and crevice and forms a cushion of soft rubber between the surfaces. It remains soft during the life of the body; therefore the adjacent parts cannot rattle, squeak, click, or chirp. Rubber dough, besides preventing local noises, acts as an insulator of sound and retards the transmission of noise from one part of the structure to another.

March Automobile Production

March production (factory sales) of motor vehicles in the United States, as reported to the Department of Commerce, was 401,378, of which 335,789 were passenger cars, 64,200 trucks, and 1,389 taxicabs, as compared with 324,018 passenger cars, trucks, and taxicabs in February and 585,455 in March, 1929.

Editor's Book Table

Book Reviews

"Annual Survey of American Chemistry." Vol. IV. July 1, 1928, to December 31, 1929. Prepared under the Auspices of the Division of Chemistry and Chemical Technology, National Research Council, James E. Mills, chairman. Edited by Clarence J. West, Director, Research Information Service, National Research Council. Published for National Research Council by The Chemical Catalog Co., Inc., 419 Fourth Ave., New York, N. Y. 1930. Cloth, 549 pages, 5 by 8¼ inches. Author index.

In this annual publication 51 specialists in chemistry and chemical technology contribute to present a complete condensed review of American chemistry for the period, from July 1, 1928 to December 31, 1929.

The review of rubber chemistry is by Harry L. Fisher, research chemist, United States Rubber Co., in a chapter outlining published contributions on rubber chemistry in general, vulcanization, latex and dispersions, accelerators, aging, physical properties, and methods of testing, reclaimed rubber, and manufacturing.

"Adhesion Problems in Connection with Rubber Flooring." Report of the Rubber Flooring Research Committee of the Propaganda Department of The International Association for Rubber and Other Cultivations in the Netherlands Indies. International Rubber Association, The Hague. 1930. Paper, 151 pages, 6½ by 10 inches. Illustrated. Index.

This comprehensive report is of great interest and importance to all concerned with overcoming the practical difficulties met with in attaching successfully rubber flooring to different sorts of materials used as sub-floors.

Following a brief outline of the problems connected with laying rubber flooring and consideration of adhesion processes in general, the succeeding chapters of the report cover the committees' testing methods and material; adhesion to wood; magnesium oxychloride floors; concrete; sawdust with cement surface screenings; other sub-floor materials. Discussion of these topics is followed by a section on specifications and instructions on installation and maintenance of rubber flooring. The book concludes with final remarks by the committee.

In concluding this admirable report the committee notes that "the crux of the problem appeared to be the construction of sub-floors suitable for the installation of rubber floors" and cites the need of mutual understanding to induce complete cooperation between rubber manufacturers and architects with regard to the application of rubber flooring.

"Materials Handling Equipment." By Edward J. Tournier. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York, N. Y.; 6 and 8 Bouverie St., E. C. 4, London, England. 1929. Cloth, 371 pages, 6 by 9 inches. 146 Illustrations. Index.

This volume, fourth in a series on Industrial Management, outlines the history, general principles, and classification of ancient and modern mechanical means for handling materials. The mechanical transportation of bulk materials as coal, ashes, coke, sand, etc., is discussed in a series of chapters supplemented by one on pneumatic conveying of dry granular materials.

Important factors in the selection and purchasing of proper equipment are covered in separate chapters. The remainder are devoted to specific means of handling materials under typical plant manufacturing conditions. The economy of mechanical handling receives general consideration and the contents of the book are made conveniently accessible by a good index. The book is valuable alike to the chemical engineer and the works manager.

"Standard Yearbook, 1930." Compiled by The National Bureau of Standards, George K. Burgess, Director, Bureau of Standards Miscellaneous Publication No. 105. United States Government Printing Office, Washington, D. C. 1930. Cloth, 301 pages, 5¾ by 9 inches. Indexed.

This annual lists the various standardizing agencies, international, national, federal, municipal, general, technical, and trade associations. The information with regard to each agency includes the name and address of the executive or secretary and an outline of the scope of work undertaken. The volume concludes with a supplementary bibliography on standardization and a full index.

New Publications

"Pigmentar" is the title of an instructive pamphlet on an important compounding ingredient handled by E. W. Colledge, General Sales Agent, Inc., 300 Madison Ave., New York, N. Y. The material is prepared to specification in 9 modern plants in 5 southern states. The booklet contains a concise presentation of the results of a year of laboratory study of Pigmentar confirmed by rubber plant experience. Its specific effects and uses are indicated and several methods are given for analytical determinations on the material.

"The Story of Asbestos and the Thermoid Company." The well-known manufacturer, the Thermoid Company, Trenton, N. J., in this booklet gives the reader some important facts about the qualities of asbestos, the mining of the material, and the rapid growth of its consumption due to the increased demand for automotive uses, particularly for brake linings, etc. A general list of Thermoid rubber products is included, also a chart indicating the probable increase of asbestos brake lining consumption from January 1, 1929, to January 1, 1934.

"Control. The Part Played by Asbestos in Modern Industry." In this illustrated pamphlet of 19 pages presented by the Thermoid Company, Trenton, N. J., asbestos and the preparation of asbestos textiles are briefly described as well as the part that the Thermoid Company has had in developing asbestos products to automotive and other industrial applications. The consumption of asbestos since 1910 is charted and a statistical summary of the Thermoid Company is given.

"Economic Material Handling Equipment." Rubber Manufacturers and plant operators generally will be interested in the means for materials handling, pictured and described in this catalog of the Economic Steel Rack Co., Bowdoin St., Everett, Mass. Among the many applications illustrated there are seven designed especially for rubber stock handling, including wood and steel platforms for lift-trucks.

Rubber-Base Printing Ink

In a new process for making printing ink vulcanized rubber is one of the chief ingredients. It is cut up, dipped into sulphuric acid, then into a caustic soda bath, and dissolved in crude petroleum. Coloring pigments, resin, tung oil, and oxide of magnesia are added, and the mixture is beaten to a semi-liquid mass. Lincoln C. Neale, French Patent No. 664,554, Nov. 24, 1928.

EDITORIALS

Business Revival Is Real

COMMERCIAL activity is quickening quite in accord with the predictions of those most competent to forecast trends of trade. January made a good advance over December; February and March made the expected moderate headway; but April showed a marked acceleration, with every prospect of the impetus not only being retained but increased. Not only was there augmented buying of indispensable products but also of so-called luxuries, notably radios, of which more were sold in the past four months than in any previous third of a year. Even sales of automobiles in the same period almost reached last year's high record. The heavy registrations of new cars shows the public to be as eager as ever for up-to-date models and that it can pay the price.

Perhaps business sentiment is always more optimistic in the spring, due in no small part to the great release of funds and productive energy for extensive out-door operations retarded by the winter, and all enhancing the general buying power. Nevertheless it is good to note the change for the better; and, assuming that business leaders heed the lessons learned at much cost last year, it is likely that the improvement though more gradual will be sounder and more long-lived than before.

One of the most gratifying features of the industrial situation is the mounting output and the steady increase in the working forces of the big rubber factories in Akron. Industrial leaders throughout the nation take much of their inspiration from the great rubber center. They know that when orders for tires are piling up, a big improvement in transportation is imminent, and that in turn implies livelier business in a host of other ways. General prosperity is not merely in the offing; it rapidly is returning.

Varying Sales and Pay Systems

THE production end of rubber factories seems to be as much perplexed in devising an ideal method of paying operatives as the merchandising end is in determining a sales policy of maximum efficiency. Each has a heavy burden to carry, and a misstep on the part of either, much less both, may mean all the difference between profit and near-ruin. In the recent past, intensive study of the problem of selling has been manifested in the radical realinement of sales forces and the setting up of various single-stop station and chain-store systems. Some of these projects will doubtless be long continued, but others must be discarded for failing to provide really economic and expeditious distribution. Only time can determine the most effective method, whether a new scheme is to supplant most if not all of the plans on trial or whether there will be a reversion to the free-for-all sales scramble.

In a less spectacular way some interesting endeavors are being made to find a basis on which employes may earn even more per hour than they now receive while increasing in higher ratio their individual production, and yet without extra tax on their energy. While many experiments are being made, at least two outstanding rubber concerns regard the problem as quite solved so far as they are concerned. One pins its faith to an exclusive paying plan under which labor is said to earn 15 per cent more, while there has been a substantial drop in production cost. The other concern, however, prefers its own piece-work system and claims that through its very simplicity it has been possible not only to keep the good will of workers but to pay them more, while increasing the per cent output of each. Apart from the merits of either system, it is safe to say that good management plays an important rôle in successful operation.

Rubber Upholstery Possibilities

OUTSIDE the rubber industry it is believed that manufacturers are disregarding a big opportunity in not developing sponge rubber upholstery. That there is great and increasing need for such seat, couch, and mattress cushioning is evident, but a notion is widespread that rubber goods of that sort are odorous and likely to lack durability. Indeed, some makers of springs, fabrics, and stuffing materials have been credited with fostering such prejudice. Once there was some justification for such bias, but that time has passed. Qualities of sponge rubber are now being produced that not only afford the maximum of comfort, luxury, and lightness, but are as odorless as and perhaps more lasting than the best of the older types of upholstery, and may be made much cheaper. In motor cars alone it should prove an ideal absorber of noise and vibration.

Rubber Mountings for Airplane Engines

WHILE rubber has been ingeniously and considerably used in the general construction of airplanes and will soon be employed also for fending off ice on the wings, its value for engine mounting does not seem fully to have been appreciated, although during the past four years automobile engineers have developed many such fittings to the great comfort and benefit of motor-car owners. Such rubber installation, through the absorption of vibration, should not only make riding more enjoyable but should markedly prolong the life of an airplane by minimizing one of the worst causes of wear, incessant motor throbbing.

What the Rubber Chemists Are Doing

Standardizing Rubber Laboratories

THE extent to which variables affect the accuracy of physical tests of rubber has been fully demonstrated by research conducted at the Bureau of Standards, Washington, D. C., under the auspices of the Physical Testing Committee, Rubber Division of the American Chemical Society. This important work culminated in a recent report by this committee on standard laboratory procedure in rubber testing.[1]

In view of the importance of standardized rubber testing the committee is attempting to assist the rubber laboratories in the United States to standardize their testing procedure.

The work of laboratory rating and its entire expense in time and money has been generously assumed by the three chemical companies represented on the committee. These are Binney & Smith Co., E. I. du Pont de Nemours & Co., Inc., and R. T. Vanderbilt Co., Inc. The work of rating will be done by 15 chemists from the laboratory staffs of these companies under the direction of D. F. Cranor, O. M. Hayden, and A. A. Somerville, chairman, respectively representing the companies named.

It is hoped to complete the work of grading the rubber plant laboratories in the United States during the ensuing few months. It is also contemplated that six months after original rating each laboratory will be visited again for checking the progress made toward realizing the full standard score. At the same time that rubber plant laboratories have been rated it is proposed to visit by invitation the laboratories of compounding ingredient supply companies, consumers of rubber goods, and others, and similarly assist them.

Perfect Rating

The following official point system for rating laboratories needs but little comment when read in connection with the committee's "Tentative Standard Procedure[1]," and the point system remarks on the next page.

A laboratory rated perfect as to rubber testing efficiency will score 167 points according to the schedule. The points allowed for temperature and humidity control count 25 per cent of the perfect score because of their importance as affecting tests. Every laboratory can be standardized without expense on items 9, 10, 18, 19, 20, 21, and 26, a total of 33 points. In point of fact attainment of the proposed standardization in full is not a matter of undue expense. For example, constant temperature water and humidity conditioning of test specimens can be secured at moderate cost as follows. Constant temperature water can be supplied by a system comprising an automatic gas water-heater with regulator valve, storage tank, and circulating pump. A humidity and temperature conditioning cabinet can be acquired cheaply and operated after the design worked out by O. M. Hayden as follows:

This apparatus utilizes the vapor pressure constants of saturated salt solutions. At 82° F. a saturated solution of potassium carbonate dihydrate ($K_2CO_3.2H_2O$) in equilibrium with solid potassium carbonate dihydrate ($K_2CO_3.2H_2O$) will maintain the air over it at approximately 45 per cent relative humidity. If the amount of water in the air exceeds 45 per cent of saturation, it is taken up by the crystals, more of which go into solution. If the water content of the air is below 45 per cent of saturation, water is given up by the solution to the air and $K_2CO_3.2H_2O$ is precipitated.

The equipment consists of a constant temperature cabinet of the shelf type with air at 82° F. circulated by a conoidal fan. The cabinet is provided with two conditioning chambers: one of which is fitted with cold water coils to cool the air intake in case the room temperature is above 82° F., and the other chamber is provided with electrically heated coils to raise the temperature of the air to 82° F. The intake air is passed through either or both of these chambers, depending upon the room temperature, by a solenoid actuated damper. The temperature of the air is controlled by a de Khotinsky thermoregulator located in the main cabinet, and the air is continually passed over the solution of potassium carbonate. The bath containing the potassium carbonate is agitated in order to prevent a crust forming over it and also to help maintain the equilibrium between the saturated solution and the excess salt.

The selection of potassium carbonate is tentative only. That fact is distinctly emphasized because it will be necessary to observe its behavior for some time before making a decision. However, the indications are that it will answer the purpose satisfactorily, and this is highly desirable because the cost of this salt is moderate.

The cabinet may be modified for use in rooms where the temperature is controlled to 82° F. by eliminating the cooling and the heating chambers. It is for use in laboratories that do not have a room controlled at the temperature of 82° F. In

Point System for Grading of Laboratories

1.	**Dimensions of Mill** *Rolls 12 by 6 inches*	4
2.	**Distance Between Guides** *10½ inches*	3
3.	**Slow Roll Speed** *24 r.p.m.*	3
4.	**Gear Ratio** *1. to 1.4*	3
5.	**Constant Temperature Water** *158° F.*	7
6.	**Mill Opening Attachment** *Adjustable to .001-inch*	6
7.	**Mill Opening Schedule** *See remarks*	4
8.	**Accuracy of Weighing** *See remarks*	5
9.	**Order of Ingredients** *See remarks*	7
10.	**Milling Procedure** *See remarks*	7
11.	**Thickness of Raw Stock** *.085-inch*	4
12.	**Storage of Raw Stock**	
	(a) **Light** *Subdued*	6
	(b) **Humidity** *45%*	6
	(c) **Temperature** *82° F.*	6
13.	**Die for Cutting Raw Stock** *5⅞ by 5⅞ inches*	3
14.	**Determination of Curing Temperature** *Thermocouple or thermometer*	7
15.	**Drainage of Platens** *Must be complete*	3
16.	**Curing Time Regulation** *From closing to opening of press on mold*	6
17.	**Mold Dimensions** *6 by 6 by .075-inch.*	3
18.	**Temperature of Molds for Raw Stock** *Mold heated 20 minutes in press*	5
19.	**Protection of Molds from Draughts** *By shields*	3
20.	**Cleanliness of Molds** *See remarks*	3
21.	**Quenching of Cured Slabs** *In cold water*	3
22.	**Die**	
	(a) **Shape** *Dumbbell of prescribed dimensions*	8
	(b) **Sharpness** *Smooth cutting edges, no nicks*	5
	(c) **Wetting Die** *In water*	3
23.	**Conditioning of Specimens**	
	(a) **Light** *Subdued*	6
	(b) **Humidity** *45%*	6
	(c) **Temperature** *82° F.*	6
24.	**Measurement of Specimens**	
	(a) **Diameter of Foot** *¼-inch*	4
	(b) **Weight on Foot** *3 ounces*	4
25.	**Testing of Specimens**	
	(a) **Speed** *20 inches per minute*	3
	(b) **Temperature** *82° F. at 45% relative humidity. See remarks also*	5
	(c) **Calibration of Machine** *By standard weights*	5
26.	**Calculation of Results** *See remarks*	5
	Total of perfect score	167

[1] "Outline of Tentative Standard Laboratory Procedure for the Preparation and Physical Testing of Rubber Samples." Physical Testing Committee, Division of Rubber Chemistry, A. C. S. INDIA RUBBER WORLD, Feb. 1, 1930, pp. 71-72.

those laboratories that have a constant temperature room at 82° F., the apparatus is of simpler construction because the heating and the cooling chambers are not required.

This important work of laboratory standardization merits unqualified support and hearty cooperation on the part of each of the more than 200 rubber laboratories in the United States engaged in rubber testing. As ordinarily performed it is not possible regularly to check rubber physical test results. If done by standardized procedure, the results are thoroughly reliable when carried out by a skillful operator. The plan of the committee to standardize rubber testing laboratories can be made effective without great expense for additional equipment. In fact many of its point system ratings can be attained at no cost whatever for new equipment.

The Physical Testing Committee, Rubber Division, A. C. S. and the business connections of its members are: A. A. Somerville, chairman, R. T. Vanderbilt Co., Inc.; D. F. Cranor, Binney & Smith Co.; T. M. Knowland, Boston Woven Hose & Rubber Co.; P. L. Wormeley, Bureau of Standards; O. M. Hayden, E. I. du Pont de Nemours & Co.; F. D. Abbott, Firestone Tire & Rubber Co.; E. W. Fuller, Fisk Rubber Co.; A. W. Carpenter, The B. F. Goodrich Co.; M. J. de France, The Goodyear Tire & Rubber Co.; W. L. Sturtevant, Raybestos-Manhattan, Inc.; R. J. Gerke, United States Rubber Co.

Point System Remarks

Item 7. Mill Opening Schedule. It is recommended that the following mill openings be used with batches corresponding to the volumes in the table:

Vol. of Batch CC.	Distance Between Rolls Inches
1,200	.170
1,100	.160
1,000	.145
900	.130
800	.120
700	.110
600	.100
500	.085
400	.070
300	.055

Item 8. Accuracy of Weighing. Weighing of all ingredients shall be accurate to within 0.25 per cent of the weight specified. The final weight of the mixed batch and the sum of the weights taken of each ingredient shall not differ by an amount exceeding 0.6 per cent with a compound batch or 0.3 per cent on master batched or gum stocks.

Item 9. Order of Ingredients. The order of adding ingredients to the broken rubber shall be as follows: accelerators and antioxidants, black, fillers, softeners, sulphur.

Item 10. Milling Procedure. During the breaking down period the mill opening shall be .055-inch until the rubber runs smooth on the roll. The opening should then be made to correspond with the volume of the batch in the foregoing table.

The ingredients should be incorporated as rapidly as possible. After the ingredients are in the rubber, it is recommended that the rubber be cut six times, alternating from side to side, cutting two-thirds of the way across the roll and holding until the bank just disappears. After the six cuts are made, the batch should be cut across and rolled six times, the roll being inserted endwise each time until the last when it should be placed lengthwise in the mill rolls. As soon as the bank is well balanced, the rolls should be set to give a sheet approximately .085-inch in thickness after cooling, and the batch be cut from the rolls.

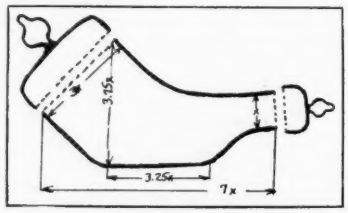
Item 20. Cleanliness of Molds. It is suggested that the molds may be cleaned, using any one of the following: (a) ground emery and water, (b) buffer cloth, (c) whiting paste.

Item 25b. The statement given in the point system is correct for rooms which are controlled at 45 per cent humidity at 82° F., but an 82° F. testing room which is equipped with a cabinet conditioning rubber at 45 per cent relative humidity would also be given the full rating of 5 points.

Item 26. Calculation of Results. Breaks which occur outside of the straightaway portion of the specimen shall be discarded. In recording the final tensile of a compound obtained by three or more individual tests, it is recommended that the highest figure, and those that come within 5 per cent of this value be averaged, discarding those results which vary more than 5 per cent from the highest tensile figure.

Duplex Weighing Tube[1]

Loss of sample with subsequent inaccuracy of analytical data is liable to occur when samples must be transferred from a watch glass or weighing bottle into a beaker or narrow-neck receptacle. Flicking of sample may also occur when the material must be brushed out of the weighing bottle or off the watch glass with a camel's-hair brush.



Duplex Weighing Tube

In order to avoid such losses and to obviate the necessity of double transference, a weighing tube has been designed to incorporate the principle of a watch glass or weighing bottle provided with an accessible and easily discharging delivery end. The device consists of a wide-mouthed glass tube with a flattened bottom side and a tapering delivery end turning up and away from the flattened side, as shown in the accompanying illustration. Details of size are given, but proportionally larger or smaller sizes are just as applicable. The use of inside or outside ground joints and caps on both ends enables the application of this weighing tube or bottle for all purposes of weighing.

The advantages in the specific details of the design given are as follows: (1) The large mouth provides for easy addition of or taking portions of the sample from the tube. (2) The designed slopes permit easy access of brush or stream of water into and against all parts of the interior. (3) The flattened side permits proper upright position during weighing and standing. (4) Distribution of the mass of glass assists in preventing the tube from easily toppling over. (5) Narrow end or stricture at delivery end permits easy transfer of solids or liquids into narrow-neck receptacle. (6) Variation of size for weighing larger or smaller samples does not involve proportional bulkiness.

[1] W. E. Eskew and Frank C. Vilbrandt, University of North Carolina, Chapel Hill, N. C., *Ind. Eng. Chem.*, Analy. Ed., Apr. 15, 1930, p. 181.

Low Temperature Curing Cement

ZBX (zinc-butyl-xanthate) and DBA (di-benzyl-amine) are two accelerators used in low temperature curing cement according to the following compounds and method.

Low Temperature Curing Cement

	A	*B*
Rubber	100	100
XX Zinc oxide	10	10
ZBX (zinc-butyl-xanthate)	6	"
DBA (di-benzyl-amine)	"	4
Sulphur	"	6
	116	120

Zinc oxide is essential but may be varied. Colors and standard compounding ingredients may be used as desired. The ratio of ZBX, DBA, and sulphur to the rubber in the above is correct.

Make up the two separate cements, preferably with benzol as the solvent. Naphtha of the proper volatility may be used. It is preferable to use two cement churns but if only one is used, it must be cleaned thoroughly after mixing the one in order not to contaminate the other. The cements may be stored in separate containers in the tube splicing room. The cement operators draw about equal amounts of each cement into their hand pails, stir well, and use.

Tubes spliced with this cement will cure in 1 to 2 hours in a warm room at 175° F. Steam cured splices have been made in 3 minutes at 25 pounds' steam. Separate cements *A* and *B* are stable for a comparatively long period of time. Blended cement should be used the day it is blended. ZBX is stable under proper storage conditions for a period of three to six months. Storage in abnormally warm atmospheres causes early decomposition. DBA is stable for long periods.

The 4 pounds of DBA may be replaced by 6 pounds of aniline if a reduction in cost is of importance. However, aniline is very volatile, and there is some danger of the fumes entering the ZBX cement and causing it to semi-cure. The well-known toxic property of aniline also is to be considered. DBA is a very stable and comparatively non-volatile, non-toxic amine especially made for this work and well adapted to the job.

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Rubber Division A. C. S.

The spring meeting of the Rubber Division, American Chemical Society, held at the Atlanta-Biltmore Hotel, Atlanta, Ga., April 7 to 12, was a notable success. The program of papers presented at the sessions of the Rubber Division were unusual in number, interest, and merit. Abstracts of all these papers were published in the April issue of this journal.

The regular division banquet was attended by 115 men. Stanley Krall, chairman of the division, introduced Webster N. Jones as toastmaster. The guests of honor included President Wm. McPherson, Secretary C. L. Parsons, and Editor H. E. Howe, of the A. C. S.; also Horace Russell, president, Atlanta Chamber of Commerce, and O. B. Keeler, of the *Atlanta Journal*, each of whom responded with short toasts. An interesting entertainment was provided.

Chicago Group A. C. S.

The Chicago Group of the Rubber Division, American Chemical Society, will hold a meeting on the evening of May 16 at Maillard's, Chicago, Ill. The topic for discussion is "Safety in the Rubber Industry." The program is in charge of R. C. Salisbury, of the Fisk Rubber Co., Cudahy, Wis., who will deliver an illustrated lecture. A dinner at 6:30 P. M. will precede the meeting. Dinner tickets at $1.50 can be obtained from B. W. Lewis, 365 E. Illinois St., Chicago, Ill.

Akron Group A. C. S.

The Akron Group of the Rubber Division, American Chemical Society, will meet on the evening of May 12 at the Akron City Club. The officers of the group have made special effort to make this the most outstanding event in the annals of rubber group meetings. The following program of papers that were written by experts in their respective subjects is of such general interest that the entire group should be present.

"Quality Control in Tire Manufacturing," J. Torrey, The Goodyear Tire & Rubber Co.; "Cleaning Rubber by Straining," Joe Maider, The Goodyear Tire & Rubber Co.; "Airplane Tires," Henry Schippel, The B. F. Goodrich Co.; "Transmission Belting," F. L. Haushalter, The B. F. Goodrich Co.; "Laboratory Evaluation of Flex Cracking Resistance," Mr. Cooper, Firestone Tire & Rubber Co.; "Modern Statistical Machinery Applied to Rubber Compounding," Mr. Morron, Mechanical Rubber Co.

New York Group A. C. S.

The second 1930 meeting and dinner of the New York Group of the Rubber Division, American Chemical Society, will be held on May 22, 6 P. M., in the Silver Grill Room, Hotel Lexington, Lexington Ave. at Forty-eighth St., New York, N. Y. The price of the tickets will be $2.50 each, and reservations should be placed with K. J. Soule, The Manhattan Rubber Mfg. Division, Passaic, N. J.

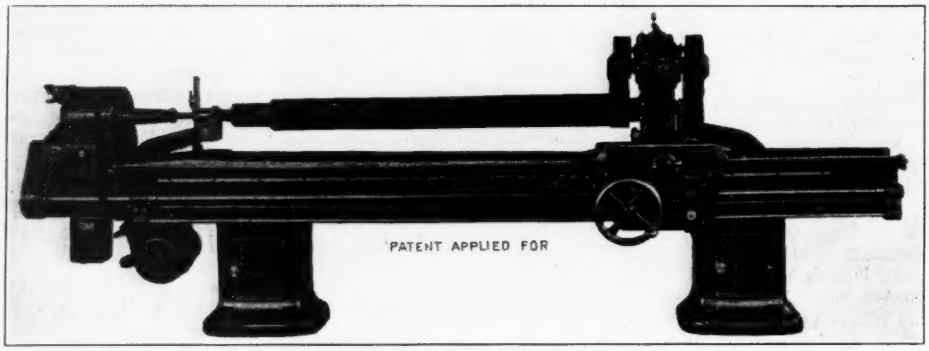
This meeting will be devoted to "Unusual Uses for Rubber," and the following papers will be presented: W. C. Geer, "Work Conducted at Cornell University—Guggenheim Foundation on Use of Rubber to Prevent Formation of Ice on Airplane Wings"; J. N. Kuzmick, The Manhattan Rubber Mfg. Division, "Rubber in the Grinding Wheel Industry"; D. E. Jones, The American Hard Rubber Co., "Rubber in the Chemical Industry"; W. A. Buedinger, E. I. du Pont de Nemours & Co., "Rubber in Articles of Clothing and Other Coated Textiles."

A Correction

In the article on "Age Resisters," published on page 56 of INDIA RUBBER WORLD, April 1, 1930, Neozone D was reported as consisting of an antisoftener and without antioxidant effect. That is in error and is corrected as follows:

Neozone D is pure phenyl-beta-naphthylamine. It is surpassed in antioxidant effect only by phenyl-alpha-naphthylamine (Neozone A). Phenyl-beta-naphthylamine is not an antisoftener and does not counteract the depolymerizing effect of high temperatures. Its tendency to darken but slightly makes Neozone D suitable for white and light colored goods.

New Machines and Appliances



Black Rock Printers' Roller Grinder

Rubber Roller Grinder

THE customary glue composition printers' rollers have always been a weak feature in printing press equipment, as they are liable to cause considerable loss whenever roll failure occurs at a critical time and especially in newspaper printing. This deficiency has been overcome by rubber rollers recently developed. They are made in suitable degrees of resiliency and toughness to meet the exacting requirements of the present-day large and swift newsprint presses.

For keeping such rollers true and in proper working condition, special grinding facilities are essential. A machine for this purpose has been especially developed and is here illustrated. It is supported on cast iron box pedestals with an overhanging bed carrying the driving and grinding mechanism. The design and construction of the mechanism gives it sufficient capacity for regrinding and polishing rollers from 3 to 7 inches diameter up to 9 feet length of roll face. Thus it will accommodate all sizes of rollers in use on the largest printing presses in service in the world.

The roller grinder is operated by two motors requiring about 3 h.p. The first motor, located underneath the driving head, serves to drive the rollers through a rubber V-belt. The head is so constructed that it has four low speeds for grinding rollers of different diameters and four high speeds for polishing different diameters. The second motor operates two emery wheels, one of which is used for sizing the roller while the other serves to produce a finished surface. The time required for grinding and finishing a roller with this tool is considerably less than by any other known device.

A feature of special importance is that which enables the machine operator to grind a roller either on its top surface or on its side or at any point between. Thus, advantage can be taken of the natural sag of the roller as it is mounted in the bearings, giving it a natural crowning.

The machine is further equipped with a gaging device by the use of which the roller is quickly located so that it can be finished within .001 of an inch of the same diameter at both ends. The Black Rock Mfg. Co., Bridgeport, Conn.

Automatic Starter

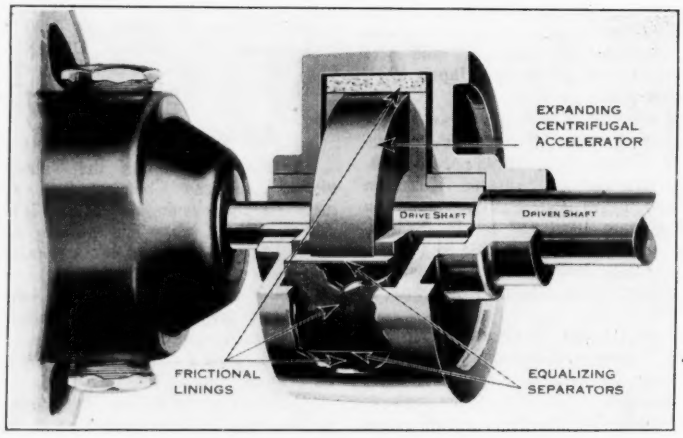
AN automatic starter for reducing starting load requirements and for absorbing shocks and vibrations is here illustrated. It allows standard motors and in many cases smaller motors to be selected for actual running loads, and oversize or specially wound motors are not needed.

This starter is unique in construction and operation. In place of balls, weights, cams, and levers for obtaining pressure, an expanding centrifugal accelerator containing a fluid automatically gives the necessary pressure. The pressure is used in a radial direction for applications such as that pictured. The fluid is usually mercury for the smaller sizes and water for the larger sizes. There can be no leakage of the fluid as the accelerator is permanently sealed.

There is no load on the motor until it has attained full speed as the action of the starter is as follows: When the starter is at rest, the fluid is in the lower part of the accelerator. The fluid requires an interval of time before it becomes distributed uniformly around the inside of the accelerator. Until this distribution takes place, there is no effective pressure. It is this condition which allows the motor to attain full speed at once.

The accelerator is keyed to the motor shaft. The gradual building up of the pressure exerted by the fluid obtains a very smooth pick-up for the driven side. There is no shock or grabbing, and the pick-up interval may be fixed to suit given conditions. The accelerator is wholly enclosed. When once installed, it requires no adjustment during its entire life. The frictional linings protect the accelerator.

Although usually applied to motors, this starter may be used with other types of



Lombard Automatic Starter

driving units and may also be applied to the driven unit. It can be arranged for direct connection, gear, chain, V-belt, or flat belt drive. It will operate either in a horizontal or a vertical position or in either direction of rotation.

Advantages claimed include reduced peak load requirements for driving units. Practically any desired starting conditions for the driven shaft may be obtained. In absorbing shocks the device reduces wear and tear on both driving and driven units. The Washburn Shop of the Worcester Polytechnic Institute, Worcester, Mass.

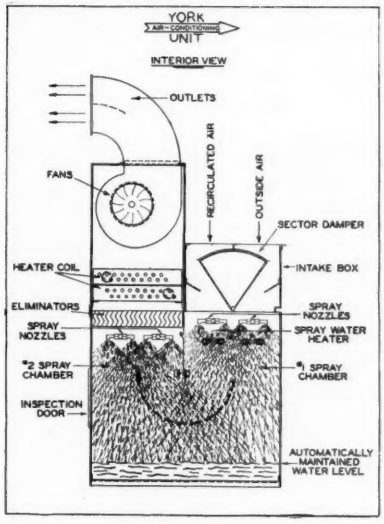
Rubber Strainer with Quick Cleaning Head

THE newest development in rubber straining machines is shown in the accompanying illustrations. The feature of this strainer is the provision for expansion of the stock as it leaves the stock screw, and the use of a strainer plate materially larger than the cylinder diameter. The head, which is closed with a gate-like strainer plate retainer, may be opened easily and quickly, and regardless of temperature. It is not necessary to have a large crew on hand or go through complicated manipulations of heating and cooling.

Seven forged steel toggle bolts turned by a suitable wrench easily release or securely fasten the retaining gate. When swung open, the straining mesh may be replaced, or in case of granular compounds a brisk application of a wire brush removes foreign matter.

Actual observation of machines working on production allow a conservative rating of 5,000 pounds of reclaim or 2,000 pounds of crude per hour for an 8-inch machine.

Straining machines with these quick cleaning heads are built in 6-, 8-, and 10-inch sizes. These machines are equipped with Timken thrust bearing, water-cooled stock screw, automatic lubrication with cooled oil, renewable cylinder bushing, complete steam and water jacketing, and Cleveland ball-bearing worm drives. Power requirements for this type of machine are very low when calculated upon the basis of output. John Royle & Sons, Paterson, N. J.



York Air-Conditioning Unit

Air-Conditioning Unit

AIR conditioning is very desirable in the dipping room of a plant making seamless goods from rubber solutions. In fact, an efficient system of air conditioning is actually essential there, in order to eliminate blisters, condensation from newly dipped goods, and other defects, all of which are quite independent of the outside weather conditions at any season of the year.

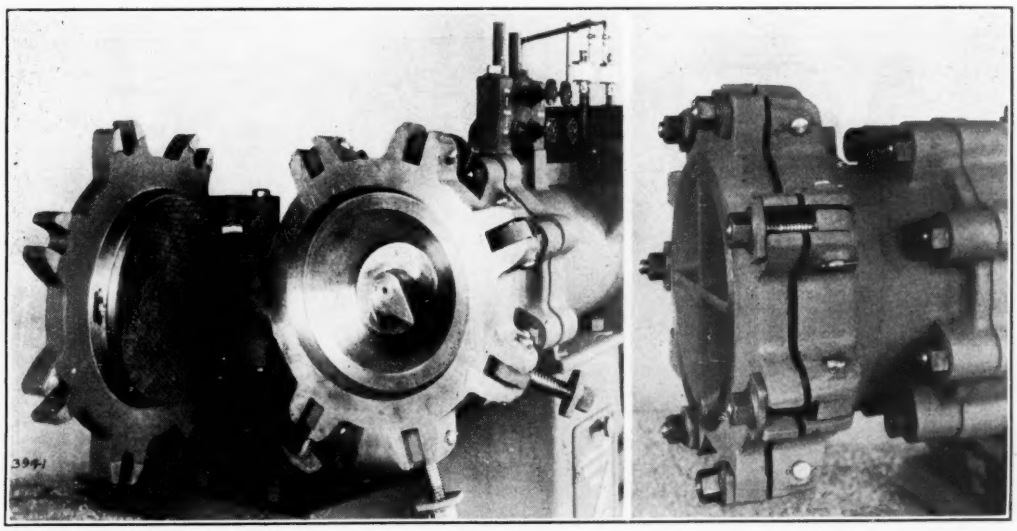
This unit apparatus indicated in the accompanying vertical interior view shows the working arrangement of an air-conditioning unit particularly interesting to small plants. It represents a self-contained air-conditioning system which is installed simply by placing the unit on location and connecting the necessary steam, water, air, and electrical service. Should requirements increase, additional units can be installed without interruption of either the manufacturing process or the air-conditioning service. Such a unit will wash, humidify, dehumidify, and heat the air and deliver it dust-free in constant supply in the dipping room.

The temperature and humidity control is attained by air-operated thermostats and controls. Air is drawn into the unit and passed through two successive spray chambers where the moisture of the air is regulated by the predetermined setting of the control.

After leaving the second spray chamber, the air passes through a series of eliminator plates which remove excess or entrained moisture from the air. Thence the air passes through the heating coil which raises the air to the desired temperature as called for by the automatic room thermostat, and then it passes into the fans from which it is discharged through outlets into the room. Once the controls are set, the desired results as to temperature and humidity may be maintained automatically without further attention. York Heating & Ventilating Corp., Philadelphia, Pa.

Farrel-Birmingham Sixty-Inch Vulcanizing Press

A RECENTLY completed modern press equipment of interest to plants manufacturing sheet packing and rubber slab products has the following dimensions. The press platens are 5 feet by 30 feet of solid steel drilled for steam circulation and fitted with water cooled ends. The surfaces are ground accurately and polished. Two rows of 12 hydraulic rams operating under 2,000 pounds' per square inch hydraulic pressure give a total pressure of 738,912 pounds on



Open Closed

Royle Quick Cleaning Strainer Head

The Kipp Air Grinder

the platens. The total weight of the press is 340,000 pounds.

A press of these dimensions has recently been installed by The Republic Rubber Co., Youngstown, O., as a part of the equipment in its modernized packing department, the complete renovation of which has been effected with the intent to increase efficiency in handling the steady increase of business. Farrel-Birmingham Co., Inc., Ansonia, Conn.

Pneumatic Grinder

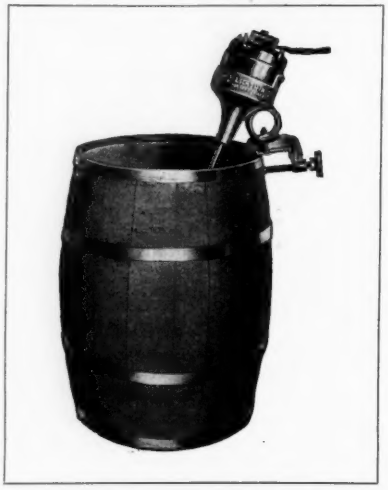
THE high speed grinder here pictured is particularly adapted for finishing irregular surfaces and small cavities in dies, metal patterns, and molds such as are required in most rubber factories as production equipment.

This tool successfully eliminates the customary hand tool means for such work. A wide range of grinding wheels as well as different forms of polishing wheels can be used on the machine. The wheels can be driven at sufficiently high speeds for efficient operation. The tool is held and used somewhat the same as a fountain pen, which it approximates in size, the over-all length being 8¼ inches and the diameter of the barrel a little thicker than a man's finger. It weighs 12 ounces and is driven by a compressed air turbine carried on the upper end of the spindle which rotates at a speed in excess of 40,000 r.p.m. Madison-Kipp Corp., Madison, Wis.

Portable Mixer

A PORTABLE mixer that can be readily mounted on any tank, kettle, barrel, or similarly deep vessel, is here illustrated. It is easily conveyed from one vessel to another in any part of the plant, thereby converting any container immediately into a complete 100 per cent mixing unit.

In a rubber plant it may be used advantageously to maintain uniformity of a cement mixing, whether of light or heavy ingredients, or for any one of many possible needs for stirring liquids, solutions, paints, or washes that may be required in connection with manufacturing processes.



"Lightnin" Portable Mixer

For mixing in barrels or drums, special folding propellers are provided that open by centrifugal force when the motor starts, and close when stopped. The angular thrust of the high speed propeller sets up a violent end to end turning over and tumbling action of the fluid mass.

A very small size of this mixer is excellently well adapted as a laboratory stirrer or mixer and for small manufacturing processes. Mixing Equipment Co., Inc., 229 E. 38th St., New York, N. Y.

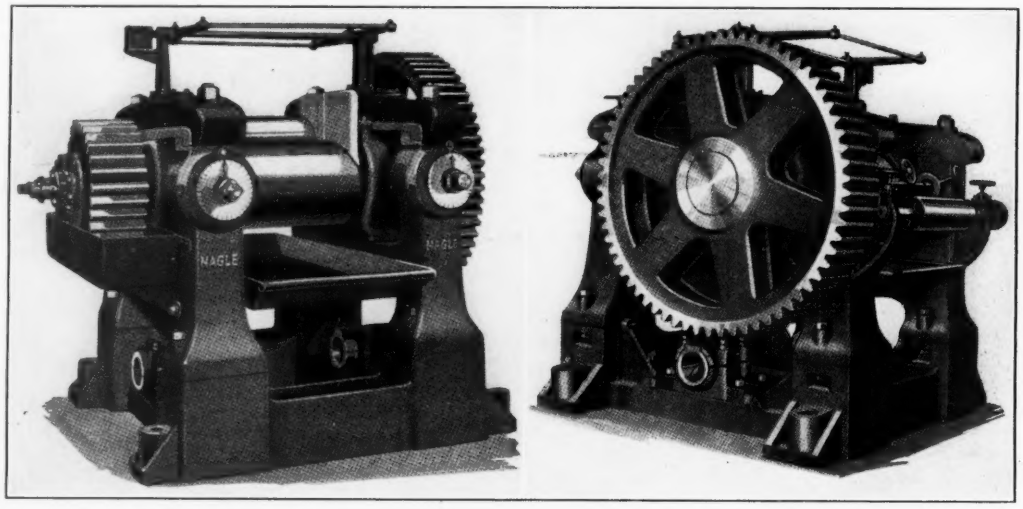
Refining Mill

IN THE preparation of batches of rubber mixings for calendering and of reclaims for compounding, a heavy duty refining mill is very advantageous. On such a machine any particles of grit or bits of metal that may have been included in the stock are crushed or flattened and work their way to the edges of the refined sheet where they are easily removable as a selvage trimming.

Refiners differ from mixing mills in several important particulars as may be noted in the front and rear views of the machine here pictured and described. The mill weighs about 48,000 pounds and the rolls are 19 and 24 inches in diameter by 30 inches face. The machine is equipped throughout with cut spur gears of very heavy construction, the journal boxes being water cooled.

On the feed side the roll adjusting screws are provided with graduated brass dials having divisions marked from 1 to 12. Pointers moved by the adjusting screws indicate by the dial readings the space interval between the rolls of the refiner, thus showing the thickness of the refined sheet.

At the rear or delivery side of the machine is located a knife scraper adjustable against the rear roll of the machine by a hand screw at either end. The scraper knife removes the refined stock in the form of a very thin sheet which the operator laps around a wind-up roller mounted in front of the rear roll of the refiner. The refined stock is removed as a slab by cutting the cylinder of rubber lengthwise from this roller. The wind-up roll is driven from the connecting pinion which has a grooved hub on one side for a round belt. Nagle Machine Co., Erie, Pa.



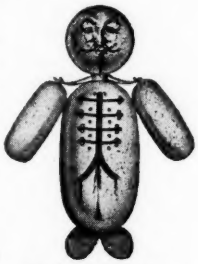
Front Side **Rear Side**

Nagle Rubber Refiner

New Goods and Specialties

Two New Toy Balloons of Timely Interest

WHAT would the springtime and the summertime be to kiddies if they had no balloons? And, of course, styles in these change, as with everything else. Two new models introduced by The Oak Rubber Co., Ravenna, O., are here illustrated.



Major Bubbles

Major Bubbles will arouse the risibilities of any child, or grown-up for that matter. Just look at him! His head and body are formed of a large airship balloon, while two smaller ones serve as arms. These are connected by a simple device around the neck. The major stands erect to his full height of twenty inches on large cardboard feet, and always manages to light on them when tossed into the air. The slightest breeze sets him moving.

Onyx

Onyx is quite attractive in modernistic fashion. It is a combination of the "Rainbo" stripe and a mottled pattern and comes in a variety of brilliant colors.

Self-Sealing Inner Tubes

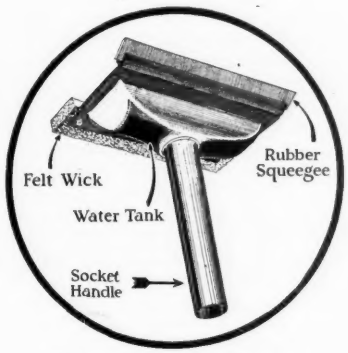
PUNCTURE still remains the chief source of annoyance to every driver, besides involving loss of time and money. A solution to the problem lies in a plastic rubber compound that automatically seals punctures as soon as they are made. Berger self-sealing inner tubes are designed on that principle. This new tube is of molded design with ingeniously built sections containing in four packets a sealing compound of plastic rubber. The layers of this plastic rubber are arranged to conform with the tread, and hold the compound always in the correct position. Overlapping pockets take care of the sidewalls. Thus, complete protection is afforded every point at which a puncture is liable to occur. When a tube is punctured, the sealing compound instantly flows to the slightest opening. Upon coming into contact with air or an outside surface, the compound hardens and effectively seals the puncture without loss of air. These tubes are manufactured in sizes to fit the tire casings. M & M Mfg. Co., Findlay, O.

Rubber Helps Facilitate Window Cleaning

A WINDOW washer that abolishes fuss and muss, such as gathering pail, mop, brush, cloth, etc., for cleaning, wet clothes and wet chapped hands, aching muscles, or water dripping on sills and floors, should appeal to housewives who must clean their own windows. Such a convenience is the Wonder Window Washer, here illustrated.

It is designed with a tank to hold its own water, which feeds onto the window pane through a felt wick. On the other end is a rubber squeegee which dries, cleans, and polishes the glass. The Wonder Window Washer is built to give lasting service. It is constructed of lightweight rigid steel. The exterior is protected with a heavy enamel finish. The interior of the water tank is scientifically treated against rust and is positively leakproof. The handle is made hollow to fit snugly over a pole when washing high windows. It is sized to fit the ordinary broom or mop handle. After long use, the felt washer or the rubber squeegees can be replaced.

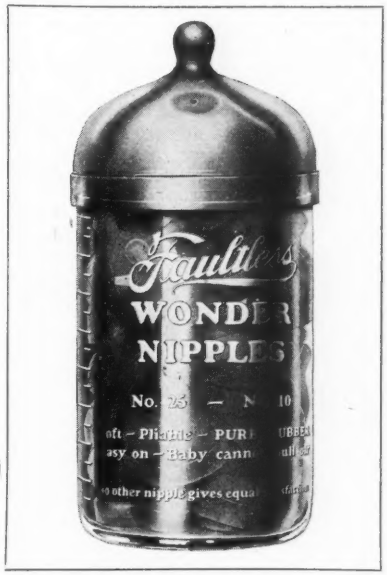
It is recommended for cleaning windows, mirrors, glass partitions, showcases, windows on automobiles, etc. This washer may be used in shops, schools, factories, and on automobiles, as well as in the home. The device has the approval of Good Housekeeping Institute, The Herald-Tribune Institute, and Modern Priscilla Proving Plant. Wonder Window Washer Corp., 31 E. Tenth St., New York, N. Y.



Wonder Window Washer

Novel Display Container for Nursing Bottle Nipples

MERELY making fine products doesn't necessarily guarantee sales. For your goods must be prominently advertised and conspicuously displayed. Realizing this, the Faultless Rubber Co., Ashland, O., hit upon the novel scheme of showing its nursing bottle nipples in the Giant Display



Giant Display Nurser

Nurser, here illustrated. It is a huge crystal glass nurser topped with a realistic big amber glass wonder nipple. The bottle is full of the nipples to be sold. The size of the display, 13 inches high and 6 inches wide, is such that it may be placed conveniently on the counter, sure of commanding attention.

Rubber Swimming Goggles

THE swimmer who ordinarily wears glasses all the time has found himself handicapped for swimming through lack of a suitable way of including his glasses in his bathing equipment. Now comes the rubber swimming goggle, covered by an English patent, into which the would-be swimmer may insert any lenses desired, even if only for protection from the glare of the sun on the water. The goggles are made in one piece of molded rubber with suitable "rims" to hold the lenses, while a rubber elastic strap is riveted to the ends to hold the goggles in place. The frames are made in such shape as to exclude water from around the eyes. Halpert & Fryxell, 311 Madison Ave., New York, N. Y.

Financial and Corporate News

National Rubber Machinery Co.

First full-year operations of the National Rubber Machinery Co., Akron, O., showed considerable improvement over the nine months of operations in 1928, when it was organized, Stanley W. Harris, president, reported to stockholders.

Net profits for the year ended December 31, 1929, were $777,393.12, equivalent after all charges, including depreciation and federal taxes, to $4.06 per share on the 113,420 shares of common stock outstanding.

The entire bonded indebtedness of $822,000 on December 31, 1928, had been retired during the year, and bank borrowings, necessitated by this retirement, had been reduced by $50,000.

Capital and surplus showed an increase of $383,515.69. Of this $231,574.83 was added to capital stock through conversion of bonds. Current assets on December 31, 1929, were $893,834 against current liabilities of $509,654.

Stockholders reduced the board of directors from eleven to nine members, electing two new members to replace four who retired. Officers reelected are: Stanley W. Harris, president and general manager; Peter DeMattia, vice president; M. D. Kuhlke, treasurer; Charles F. Safreed, secretary and assistant treasurer; and John Shaub, factory manager in charge of the company's four plants: the Akron Rubber Mold plant and the Kuhlke Machine plant, both at Akron, the DeMattia Brothers plant, Clifton, N. J., and the Banner Machine plant, Columbiana, O.

New Directorate and Financing for Goodrich

Directors of The B. F. Goodrich Co. on April 12 approved the issue of $30,000,000 of Fifteen-Year, 6 per cent convertible debentures for liquidating current borrowings, including the acquisition of the Hood Rubber Co. and Miller Co.

The directors also voted to increase the authorized common shares, without par value, from 1,500,000, of which 1,167.000 are outstanding, to 4,000,000 shares. A portion of the additional shares are to be reserved for conversion of the debentures.

Operations for the first quarter of the calendar year resulted in a loss of $400,000 after depreciation but before interest. The company charged to current operations all losses due to write-downs of raw materials as of March 31. No part of the reserve of $1,330,000 provided in 1929 has been used.

The consolidated balance sheet of the company and its subsidiaries, as of December 31, 1929, adjusted to the acquisition of the Miller Rubber Co. and the contemplated issue of debentures, shows net tangible assets applicable to the debentures equivalent to $4,200 for each $1,000 of debenture and current assets of $100,418,000 or 9.6 times current liabilities of $10,452,000.

Average annual net earnings available for interest and federal taxes for the period from 1925 to 1929 inclusive were $11,454,621 or over 2.9 times maximum annual interest requirements on all funded debt including the debentures, to be outstanding, and 5.18 times annual interest requirements on the contemplated issue of debentures after allowance for interest on the first mortgage bonds and subsidiary debt.

The following directors have resigned: A. A. Tilney, Vice Chairman, The Bankers Trust Co.; Joseph R. Swan, President, Guaranty Co. of New York; and W. A. Means, formerly Treasurer, The B. F. Goodrich Co. Four new directors were elected: Charles S. McCain, President, Chase National Bank of New York; Frank H. Hobson, Vice President, Cleveland Trust Co. and a director of Continental Shares, Inc.; Arthur H. Marks, Director, Curtiss Airplane & Motor Co., Inc., and President of the Skinner Organ Co.; Albert A. Sprague, Chairman of the Board of Sprague-Warner & Co., and Director of the Chicago, Northwestern Ry., and Director of the Continental-Illinois Bank & Trust Co.

Thermoid Sales Gained 67 Per Cent Last Month

Despite the fact that automobile production is currently showing a 30 per cent decrease as compared with a year ago, increased sales are reported by the Thermoid Company, Trenton, N. J., manufacturer of asbestos products, including brake lining, according to Robert J. Stokes, president. A heavier demand from the automotive replacement market is the most important factor in the company's improved position.

Thermoid's sales in March, 1930, showed an increase of 67 per cent as compared with the preceding month and an increase of 6 per cent as compared with March, 1929.

NEW INCORPORATIONS

Goodyear Rubber Co. of N. Y., Inc., Apr. 16 (N. Y.), capital stock 200 shares, no par value. H. S. Guy, 329 Main St., A. V. McDowell and D. E. Gray, both of 25 Hamlin St., all of Middletown, Conn. Rubber of all kinds.

Hood Tire Corp., Apr. 7 (N. Y.), $200,000. S. M. Jett, 500 S. Main St., Akron, O., M. K. Peters and M. M. Probst, both of 33 W. 60th St., New York, N. Y. Deal in rubber goods of all kinds.

Master Tire & Rubber Corp., Mar. 26 (Del.), capital stock 20,000 shares preferred, par value $100, and 135,000 shares common without par value. H. E. Grantland, H. H. Snow, and L. E. Gray, all of Wilmington, Del. To manufacture, produce, buy, sell, and generally deal in and with all kinds of rubber goods and products.

Trojan Composition Corp., Mar. 25 (Del.), capital stock 500 shares preferred and 100,000 shares common all without par value. R. A. Van Voorhis, 239 Overlook Ave., Belleville, N. J., R. H. Toothe, 654 E. 24th St., Brooklyn, N. Y., and A. M. Docken, 621 Willow Ave., Hoboken, N. J. Principal office, New York, N. Y. To manufacture, buy, sell, import, export, trade, and deal in molded or coated or impregnated rubber specialties such as mechanical rubber goods.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2632	Italian Tire Exports, First Nine Months, 1929.
2633	Canadian Tire Exports, Month of January, 1930.
2634	French Tire Exports, Month of January, 1930.
2635	French Footwear Exports, Month of January, 1930.
2637	German Tire Exports, Calendar Year 1929.
2639	Analysis of Export Markets for Belting in 1928.
2640	German Exports of Belting and Hose, Calendar Year 1929.
2644	Merger of Companies for Manufacture of Braided Hose in England.
2645	Market for Footwear in Stavangar Consular District.
2649	British Exports and Imports of Tires and Inner Tubes, Calendar Year 1929.
2650	Dealers' Stocks of Footwear in the United States, March 1, 1930.
2655	Analysis of Export Markets for Hose, 1927.
2657	Analysis of Export Markets for Hose, 1928.
2658	British Exports of Rubber and Balata Belting, Tubing, and Packing, Calendar Year 1929.

While tire men are guessing as to how their industry may be affected if the $200 "baby auto" should achieve flivver-like popularity, the men who would make rubber galluses for the wheels instead of springs do not appear to worry much.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
General Tire & Rubber Co.	Com.	$1.00 q.	May 1	Apr. 17
Mohawk Rubber Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 28
Stedman Rubber Flooring Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 26
Thermoid Company	Com.	$0.50 q.	May 1	Apr. 15
Thermoid Company	Pfd.	$1.75 q.	May 1	Apr. 15

The Rubber Industry in America

OHIO

William O'Neil, president of the General Tire & Rubber Co., Akron, O., at the beginning of the year predicted that 1930 would be a better year in the replacement tire business than 1929 was, and already this is proving to be true. Recently he declared:

"Our company's sales volume for the first ten weeks this year has been considerably ahead of the same period last year. Our volume of business, as measured by the actual shipment of General tires, was 12 per cent larger in February than in the same month in 1929, while sales for the first two weeks in March show an increase over the same two weeks in March, 1929.

"The tire industry now is on a stable basis, and I believe that the several mergers of tire companies during the past year will benefit the industry as a whole."

That car owners and distributers not only are ordering more tires but are also paying for them more readily is shown by Mr. O'Neil's statement that cash remittances during January and February this year were 5 per cent ahead of the collections for the same two months in 1929.

The Master Tire & Rubber Corp. has been organized under the laws of Delaware with authorized capitalization of 20,000 shares of $100 par preferred stock and 135,000 shares of no par common stock. The new company has already acquired through exchange of securities large holdings of the capital stock of the Falls Rubber Co., Cuyahoga Falls, and the Cooper Corp., Findlay, both in O. It is expected that an offer will be made to other stockholders in these companies for exchange of their stocks. For the company has plans for consolidation of the management of the Falls and the Cooper organizations, a move expected to result in material economies.

Officers of the Master company are: president, Ira J. Cooper, president of the Cooper Corp.; vice president, Frank C. Millhoff, formerly chief sales executive of the Miller Rubber Co., Akron, O.; vice president and treasurer, W. P. Cline, president of the Falls Rubber Co.; and secretary, R. P. Bremer. The officers and the following members comprise the board of directors: J. F. Schaefer, W. G. Lerch, J. B. Firestone, and R. L. Kryder.

D. H. Owen Co., manufacturer of household rubber specialties, recently moved its office from Akron, O., to 1212 Seventh St., S. W., Canton, O., where it has leased the plant of the former Triangle Tire & Rubber Co. and is manufacturing stair treads, hose, rubber rugs, mats, and other household products.

The Ohio Rubber Co., Cleveland and Willoughby, O., through Henry Hallock, president and general manager, has announced the resignation of C. Edward Hyke, for many years manager of the Willoughby plant. Ill health has incapacitated Mr. Hyke for several months.

J. R. Silver has organized the Akron Chemical Co. with offices at the Metropolitan Building, Akron, O., and will serve manufacturers of chemical colors and pigments who wish technical representation in the rubber field.

The Dayton Rubber Mfg. Co., Dayton, O., has stated that Glenn R. Murray has joined the staff as assistant credit manager.

C. A. Dwyer joined the sales department of the Akron Rubber Reclaiming Co., Barberton, O., on April 1. This marks his return to the rubber business after an absence of about three years. Mr. Dwyer was formerly connected

C. A. Dwyer

with the sales department of The Goodyear Tire & Rubber Co., later becoming associated with the Seiberling Rubber Co. One of his earlier rubber connections was selling reclaimed rubber for the Goodyear company, and his many friends will welcome him back to his old business.

E. B. Busenburg, formerly assistant chemist of The Philadelphia Rubber Works Co., Akron, O., has been appointed chief chemist of that company, succeeding Dr. H. A. Winkelmann, who recently resigned.

Dr. Hugo Eckener, commander of the globe-circling "Graf Zeppelin," has become definitely linked with Akron and other American interests in a trans-Atlantic mail and passenger line, according to current reports. Dispatches said Dr. Eckener had signed contracts with the International Zeppelin Transport Co., the National City Co., the Goodyear Zeppelin Corp., the German Zeppelin Co., Carbide & Carbon Chemicals Co., United Aircraft Corp., and the Aluminum Co. of America, for the establishment of the trans-oceanic line.

Akron is linked in the project through the Goodyear Zeppelin Corp. and the International Zeppelin Transport Corp. of which P. W. Litchfield, president of The Goodyear Tire & Rubber Co., is the head.

Dr. Eckener left Akron early last month to return to his native land.

Harshaw Expansions

The Harshaw Chemical Co., manufacturer of rubber compounding chemicals, pigments, and colors, has purchased a four-story building at 1945 E. 97th St., Cleveland, O., to house the executive and sales offices and laboratories. The move was made necessary when its quarters in the Hanna Building in Cleveland were outgrown. Comprising about 20,000 square feet of floor space, standing on a four-acre tract, the new building provides for expansion and continued diversification in new products which the company will develop.

Founded in 1892 in a very modest way by W. A. Harshaw, president, the business has grown until thousands of manufacturers depend on it for chemicals essential to uninterrupted production. Branch offices are maintained in Chicago, Ill., New York, N. Y., and Philadelphia, Pa., and the company is represented with stocks and offices in most large consuming centers of the country.

Harshaw recently completed a new, modern factory for producing metallic colors at Elyria, O., where it also has new offices. This was made necessary by the unprecedented demand for color by all branches of the ceramic industry. Two large buildings and equipment have been bought adjoining the Elyria plant where new products are to be produced.

At Philadelphia a new warehouse and office building has been constructed, and at the Cleveland plant land has been purchased for expansion.

The expansion program has called for changes in organization and personnel during the past year, the most noteworthy of which is the addition of Wm. B. Lawson as vice president. To join the Harshaw company Mr. Lawson resigned as director of sales of The International Nickel Co. of Canada, Ltd., with whom he had been associated for twenty-five years.

Firestone Operations

The Firestone Tire & Rubber Co., Akron, O., recently promoted L. G. Fairbank, formerly manager of truck and bus sales, to trade sales manager. Mr. Fairbank has been with Firestone sixteen years, beginning in the advertising department and later becoming assistant manager. He was transferred to the sales department, becoming manager of the Eastern Division. He has served also as manager of manufacturers sales and as vice president of the Firestone Steel Products Co.

Firestone is developing a 1,000,000-acre rubber plantation in Liberia. Started five years ago, the first rubber from the newly planted areas will be harvested this fall, according to officials.

Harvey S. Firestone, Jr., vice president of the Firestone Plantations Co., now is also president of the United States-Liberia Radio Corp., recently granted operating licenses by authority of the Federal Radio Commission and the Republic of Liberia. Short wave service to Liberia with Akron as the terminus is now in operation.

In the heart of the Firestone producing areas and about fifty miles north of Monrovia, capital of Liberia, recently was dedicated the first bridge to span the historic Du River. The bridge, 190 feet long, entirely of steel and concrete, was built by Firestone construction experts especially imported for the work.

Goodyear Annual Meeting and Election of Officers

Paul W. Litchfield was reelected president of The Goodyear Tire & Rubber Co., Akron, O., at an annual meeting held on March 31. He was named also chairman of the board of directors.

The stockholders' meeting approved the increase in authorized common stock from 1,450,000 to 5,000,000 shares. More than 91 per cent of the common stockholders and 77 per cent of preferred stockholders were represented either in person or by proxy at the meeting.

Other officers besides Mr. Litchfield who were reelected are C. Slusser, R. S. Wilson, Chas. A. Stillman, and Fred M. Harpham, vice presidents; P. E. H. Leroy, treasurer; Z. C. Oseland and H. H. Hanna, assistant treasurers; W. D. Shilts, secretary; F. R. Wahl and W. M. Mettler, assistant secretaries; C. H. Brook, comptroller; C. L. Weberg and H. D. Hoskin, assistant comptrollers.

The following directors were named: James T. Begg, W. R. Burwell, R. E. Christie, Jr., T. M. Girdler, Edward B. Greene, J. Arthur House, P. W. Litchfield, H. B. Manton, G. A. Martin, Grayson M. P. Murphy, J. R. Nutt, H. W. O'Melveny, A. G. Partridge, Robert C. Schaffner, Francis Seiberling, C. F. Stone, and G. A. Tomlinson.

The former directors not reelected are: Robert H. Bishop, Jr., Fayette Brown, George B. Durell, Elton Hoyt II, Walter B. Mahoney, John Sherwin, and Samuel L. Smith.

In an interview after the meeting Mr. Litchfield stated that there was no present prospect of the actual issue of any of the additional shares authorized. Commenting on various rumors of mergers with other rubber companies, he said that no such matter was before the meeting of stockholders or directors and that no consolidation or merger was in contemplation.

In spite of Mr. Litchfield's statement rumors persist of a merger between Goodyear and the Seiberling Rubber Co., Akron. The United States Rubber Co., New York, N. Y., has been repeatedly named as a possible third in the consolidation, and one report hints that even The Firestone Tire & Rubber Co., Akron, also may eventually be included.

C. C. Slusser, Goodyear vice president and factory manager, was one of the three speakers scheduled for the Industrial Safety Rally held on April 23 at the Akron armory under the auspices of the Akron chamber of commerce.

Arthur H. Marks Returns to the Rubber Industry

Arthur H. Marks, Director, Curtiss Airplane & Motor Co., Inc., and President, Skinner Organ Co., returned to the directorate of The B. F. Goodrich Co. on April 12, with which company he was identified as vice president and general manager from 1912 to 1917, when he retired to assume other interests.

He is well known as the inventor of Marks' alkali process for reclaiming vulcanized rubber scrap patented October 17, 1889. This process has long been recognized as of outstanding industrial importance and is universally employed for reclaiming rubber from vulcanized scrap. Other successes in the rubber industry are credited to Mr. Marks during his earlier years of management.

His renewed association with the Goodrich company is an event of first importance to that organization.

Magnetic Reversing Switch

A new magnetic reversing switch with increased ability to control motors of large horsepower is designed to throw small alternating-current motors directly across the line. It consists of two triple-pole, mechanically interlocked, magnetically operated contactors with restricted-type blowouts, and with a normally-open interlock on each contactor. It also has two hand-reset temperature overload relays.

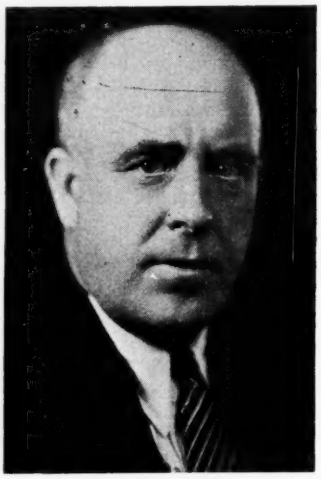
Maximum horsepower ratings of this new General Electric switch are as follows:

Volts	3- & 2-phase, 3- or 4-wire	Single-phase
110	7½	3
220	15	7½
440	15	10
550	15	10
600	15	10

Reclaimed Rubber Expert

From politics to rubber! What a change! But William Welch, vice president of The Akron Rubber Reclaiming Co., Barberton, O., made it in 1916 and has never regretted his choice. The industry is indeed glad he made the decision he did.

"Bill" was born in the village of Fine, St. Lawrence Co., N. Y., on September 22, 1887. He attended the local elementary school and the Watertown High



William Welch

School from which he was graduated. He then did some commercial work in and near Watertown for a few years. Politics beckoned, and through some politicians of his acquaintance Mr. Welch went to Albany where he was appointed to secretarial posts.

But after a few years he still was not satisfied. Tales of Akron, O., and the gigantic strides of the rubber industry fired his ambition. He left for Akron in 1916 and joined The Goodyear Tire & Rubber Co. in charge of reclaimed rubber sales. While so engaged, he saw the opportunity for handling this business on a large scale. So in 1923 he resigned and organized The Akron Rubber Reclaiming Co., of which he is now vice president, general manager, and sales manager.

With the expansion of the concern, in 1926 he started the Midwest Rubber Reclaiming Co., E. St. Louis, Ill. He is its president. Mr. Welch was active also in forming the Rubber Reclaimers Association and serves as vice president and director.

He belongs to the Rotary Club, Barberton, the Elks and Congress Lake Country Clubs, both of Akron, the Missouri Athletic Club, St. Louis, and the Chemists Club, New York. He is, furthermore, an aeronautical enthusiast.

Mr. Welch is noted for his optimism, joviality, and fair dealing. He can play golf but prefers hunting, boxing bouts, and the Kentucky Derby. Another hobby is spending his vacations in the wilds of northern Canada. He likes good music and is widely read. Occasionally he plays bridge. He enjoys, too, the company of men. With Mrs. Welch he resides in Akron.

NEW JERSEY

Some New Jersey rubber companies report decreased business during the past month, while others pronounce it good for certain products. The present hard rubber situation is not satisfactory, but manufacturers hope that it will improve by late spring. Some hose plants are working on orders for spring delivery, and this will keep them occupied until other mechanical lines pick up. Tire and tube plants are running normally and in some cases overtime. The shoe and heel industry remains good.

The Pierce-Roberts Rubber Co., Trenton, N. J., has experienced decreased business during the past months.

The Pocono Rubber Cloth Co., Trenton, N. J., shows a decided gain in business.

Francis A. Lasher, former purchasing agent of the Acme Rubber Mfg. Co., who died recently, left a will instructing the executors to sell the H. N. Richards Chemical Co., Trenton, N. J., of which he had been president. The will designates $5,000 for the education of his daughter, Elizabeth, 14 years old. A yearly income is also left to his widow, Mrs. C. Lasher.

The Joseph Stokes Rubber Co., Trenton, N. J., reveals that business has dropped off slightly during the month with fewer orders for hard rubber goods.

Dr. Peter Fireman, president and owner of the Lambertville Rubber Co., Lambertville, and the Magnetic Pigment Co., Trenton, both in New Jersey, will shortly erect a mansion and a laboratory on Goat Hill, Lambertville, the highest point in that section of New Jersey.

The Luzerne Rubber Co., Trenton, N. J., reports quiet business conditions, expected shortly to improve.

Whitehead Bros. Rubber Co., Trenton, N. J., says its business in all lines is very good, particularly for belting and hose.

Edgar H. Wilson, of Flemington, N. J., formerly connected with the Dural Rubber Co., Flemington, is slated for a place on the State Board of Conservation and Development.

Norwood Tire Co., Inc., Long Branch, N. J., recently entertained seven hundred garagemen and dealers in automotive equipment at a "clinic and open house" at the main office and show rooms, 626 Broadway. Inspection tours over the large plant of the Long Branch company were made by the visitors, who were from different sections of New Jersey, and demonstrations were given by representatives of the various equipment manufacturers. The Norwood company is the largest wholesale distributing house of its kind in the state.

J. Cornell Murray, treasurer of the Crescent Insulated Wire & Cable Co., Trenton, N. J., has been elected a director of the Trenton Inter-State Fair Association.

The Essex Rubber Co., Trenton, N. J., announces very active business rapidly approaching normalcy. Business dropped off in January and showed little gain in February and March, but officials declare it improved considerably during April, with prospects for a good summer.

The Thermoid Company, Trenton, N. J., continues to operate day and night in filling orders.

The Mercer Rubber Co., Hamilton Square, N. J., reports that business is somewhat quiet at present.

The Puritan Rubber Co., Trenton, N. J., states that present business is very good and that orders and sales have increased 50 per cent. The concern is filling large orders for rubber tile for jobbing houses. Miah Marcus, treasurer of the company, sailed on April 25 for a business trip through Europe where the company has agencies in several of the larger cities.

Murray Changes

The Murray Rubber Co., Trenton, N. J., announces the resignation of its president, C. Edward Murray, Jr., and his brother, J. Cornell Murray, a member of the board of directors. Mr. Murray, Jr., has not revealed future plans, nor has his successor been appointed. General C. Edward Murray, Sr., severed his connection some time ago. Control of the company now has passed from the family whose name it bears.

The rubber company met financial reverses some years ago when the Sears-Roebuck Co. cancelled a large tire contract. At that time several investment and commercial banking institutions bought substantial stock holdings in the Murray company. Principal among the purchasers was Caldwell & Co., bankers, Nashville, Tenn., which now has a large majority on the Murray board of directors.

At the reorganization of the directorate the following were named as members: J. D. Carter, E. H. Heitzeberg, L. B. Stevens, T. G. Donovan, W. S. Walker, and Alfred H. Branham, representing Caldwell; C. F. Jones, for the National Bank of Kentucky, Louisville; and B. B. Hicks, vice president of the Third National Bank & Trust Co., Scranton, Pa. Mr. Branham, representing the Caldwell firm, has been in charge of affairs at the Murray plant for the past year as vice president, in which capacity he will continue.

Production at the plant has been under supervision of the Caldwell com-

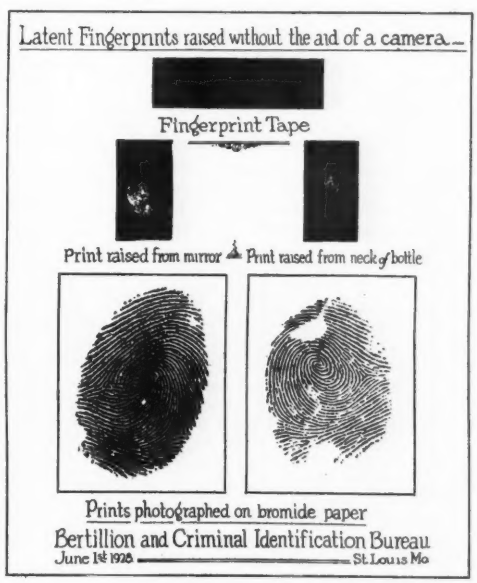
BLACK RUBBER TAPE AND ALUMINUM BRONZE POWDER SERVE MODERN FINGERPRINT SLEUTHS

A SPECIAL tape of black rubber has recently been patented by a St. Louis detective as a part of a fingerprint recording system recently developed.

The fingerprint to be photographed is first dusted with aluminum bronze powder, similar to the pigment used in aluminum paint and in the rubber industry. The aluminum image of the print is then transferred to the special tape, where a transparent shield protects the image against damage but allows it to be easily photographed. The gleaming aluminum image offers brilliant contrast to the intense black of the rubber tape surface.

Of special value in working with fingerprints where curved or bevelled surfaces would perilously handicap the photographer in obtaining a good reproduction, the invention of Major Richard M. Joyce, head of the Identification Bureau of the St. Louis Police Department, promises to supersede present practice to a large extent. The aluminum "transfer" system also extends fingerprint recording facilities to rural districts not able to purchase and operate the usual police photographic equipment.

The following illustration shows how latent fingerprints are raised without a camera.



pany for the past year and has increased until at present the factory is running to full capacity on tires and tubes with three shifts working 24 hours a day. Employes number 500. The company has opened a chain of nearly 1,500 stores in cities throughout the United States.

The Murray company announces a big increase in business during the past few weeks. The company has decided to give up permanently the manufacture of mechanical goods. It has received offers to lease its modern mechanical goods department and soon will arrive at a decision.

Legal

Adjudicated Patents

TIRE. Overman Cushion Tire Co., Inc., vs. Goodyear Tire & Rubber Co., Inc.

The United States Circuit Court of Appeals for the Second Circuit affirmed the decision of the United States District Court, Southern District of New York, in the suit for infringement of Overman Patent No. 1,092,078, March 31, 1914, and Overman Reissue Patent No. 13,626, October 7, 1913, covering cushion tires for vehicles.

The opinion by Circuit Judge Chase is quoted as follows. Since no appeal was taken by the plaintiff, we shall disregard Reissue No. 13,626 and the claims of No. 1,092,078 which were not adjudicated. This patent granted March 31, 1914, was for an improvement in cushion tires designed for use on vehicles. It contained 12 claims. Of these only claims 6 and 10 were adjudicated. They were held valid and infringed, and read as follows:

6. A new article of manufacture, a cushion tire which is hollow by means of a longitudinal opening having a V-shaped transverse section whose base is at the flange-engaged portion of the tire and whose apex extends toward the tread well below said flange-engaged portion, said tire having thick sidewalls at the sides of said opening and a deep nose portion extending across the apex of said opening and across the lower ends of said walls, said nose portion having a bottom with a wide ground-contact delivering the vertical thrusts from the tread well under said sidewalls.

10. A new article of manufacture, a cushion tire which is hollow by means of a longitudinal opening having a V-shaped transverse section whose base is at the flange-engaged portion of the tire and whose apex extends toward the tread well below said flange-engaged portion, said tire having thick upright sidewalls at the sides of said opening and a deep nose portion extending across the apex of said opening and across the lower ends of said walls, said nose portion having a bottom with a wide ground-contact delivering the vertical thrusts from the tread well under said sidewalls, said tire having its outer sides below its flange-engaged portion and adjacent the longitudinal opening steeply converging toward the tread in substantially straight lines.

NEW ENGLAND

U. S. Rubber Concentrates Activities in Providence

A vision of Providence, R. I., as a leader in the rubber industry arose last month as a result of the announcement by the United States Rubber Co. that an extensive expansion program has been planned greatly enlarging facilities and increasing employes from 4,000 to 6,000 at the Providence plant. According to the announcement the company is to move its rubber tile flooring and rubber rolls division from Chelsea, Mass., and Chicago, Ill., and concentrate them at the Valley St. plant in Providence. This move is part of a plan for concentrating the corporation's manufacturing and sales activities at a few specific points. Two new buildings have recently been completed at Valley St. and are now being equipped with necessary machinery.

The announcement of the proposed additional departments was followed within a week, on April 15, by a dinner to the rubber company officials under the auspices of the Providence Chamber of Commerce, held at the Providence-Biltmore Hotel. More than 400 executives and business men of the city attended, including His Excellency Governor Norman S. Case and His Honor Mayor James E. Dunne. Among the officials of the rubber company were: Francis B. Davis, Jr., president and chairman of the board of directors; Harlow W. Waite, general manager of the sundries department at Providence; five vice presidents—William DeKrafft, Edward J. Coughlin, Ernest Hopkinson, in charge of research work, Herbert E. Smith, and Lucius D. Tompkins; C. S. Ching, director of industrial and public relations; Walter Gussenhoven, general manager of the mechanical department; Edward S. Underhill, publicity director; while fifty members of the sales force of the rubber tile flooring department, including representatives from the Far West, had a separate table.

Following addresses by the government officials, President Davis, Manager Waite, Vice President Hopkinson, and Mr. Ching also spoke. Recalling that Rhode Island is the birthplace of his company in its corporate form, Mr. Davis outlined its newly adopted policy of decentralization of the company organization itself and the centralization of its plants and activities. To that end each of the various departments and subsidiaries has been placed under its own manager, who is directly responsible for its operation. On the other hand its numerous and widely separated plants are being grouped.

The sales force spent the entire week in Providence in conferences, visits to the company's plants, and explaining the large display of U. S. products in the ballroom foyer at the Biltmore Hotel. Various officials of other New England plants of the company during the week visited the Valley St. plant.

The Thermoid Company, Trenton, N. J., recently appointed F. G. Leland supervisor of sales for the territory including the six New England States. His headquarters are at Boston, Mass.

Wallace C. Hutton, treasurer of the Seamless Rubber Co., New Haven, Conn., was guest speaker at the eighth annual meeting of the Holyoke Community Welfare League on April 24. His topic was "The Value of the Community Chest to Industry and to the Community." Mr. Hutton has long been a worker in civic and welfare activities in New Haven.

Dr. Ellwood B. Spear has joined the Vultex Chemical Co., 708 Main St., Cambridge, Mass., where he is engaged in research and development work.

The National India Rubber Co. on April 21 began operating the shoe division of its Bristol, R. I., plant on a four-day week schedule, after following a five-day schedule for several weeks, and previously a long period of five and a half working days each week. This curtailment at this time is regarded as usual by Manager Maurice C. Smith, Jr. The insulated wire division of the plant continues on the five-and-a-half-day schedule.

MEETING OF COMMITTEE D-11 A. S. T. M.

A rubber belting symposium will be conducted by Committee D-11 on Rubber Products at the annual meeting of the society to be held at Atlantic City, N. J., on June 23 to 27, 1930. Papers on power transmission, stretch conditions, and service life tests will be included in the symposium.

There will be three A. S. T. M. standard specifications for approval by the American Standards Association as follows: Rubber Gloves for Electrical Workers on Apparatus or Circuits Not Exceeding 3,000 Volts to Ground, (D 120-23); Rubber Matting for Use around Electrical Apparatus or Circuits Not Exceeding 3,000 Volts to Ground, (D 178-24); Friction Tape for General Use for Electrical Purposes, (D 69-28).

Preparation of specifications for insulated wire and cable modified to permit the use of organic accelerators and antioxidants has been authorized. Particular emphasis was placed on the use of performance tests for the evaluation of these products instead of the usual detailed materials specifications.

Revision of the Standard Methods of Testing Rubber Products (D 15-24) to include in so far as practical the methods recommended in the recently proposed "Outline of Procedure for Preparation and Testing of Rubber Samples" recommended by the Physical Testing Committee of the Rubber Section, A. C. S., was authorized.

The present Tentative Methods of Chemical Analysis of Rubber Products (D 297-29 T) are to be revised in so far as they are affected by the presence of organic accelerators and antioxidants.

EASTERN AND SOUTHERN

Jungmann & Co., Inc., dealer in chemicals, drugs, and raw materials, on March 31 moved its offices to 155 Sixth Ave., New York, N. Y. Its receiving and delivery departments are located at 240 Spring St., also in New York. The telephone numbers remain unchanged: Walker 7153-54.

Frank E. Rupert, for three years research associate at the Bureau of Standards, Washington, D. C., engaged in work of the Physical Testing Committee, Rubber Division, A. C. S., since April 1 has been research rubber technologist with the Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y.

Pusinelli & Poel, Inc., crude rubber importer and dealer, 347 Madison Ave., New York, N. Y., recently was organized as successor to Poel & Kelly, Inc. The directorate includes Fred Pusinelli and Frank and Harold E. Poel.

W. B. Kochenderfer, formerly in charge of engineering and sales for The Lake Erie Engineering Corp., Buffalo, N. Y., has recently been appointed chief engineer of the hydraulic machinery department of R. D. Wood & Co., Philadelphia, Pa., with works at Florence, N. J., pioneer builder of hydraulic machinery for the rubber and the bakelite industries.

The Revertex Corporation of America was incorporated on April 25, 1930. The new concern has offices at 40 Rector St., New York, N. Y., and is the sole distributer for the United States and Canada of the patented concentrated rubber latex sold under the trade name, "Revertex."

Belmont Packing & Rubber Co., manufacturer of packings and mechanical rubber goods, on April 21 moved its New York, N. Y., office from 99 Chambers St. to 200 Church St.

Bierrie & Co., Inc., crude rubber importer and exporter, on April 21 moved its office to the Lefcourt-Colonial Bldg., 295 Madison Ave., New York, N. Y. Telephones: Ashland 1581-83.

H. W. Butterworth & Sons Co., manufacturer of textile finishing machinery, with plants at Philadelphia and Bethayres, Pa., will occupy spaces 283-284-285-330-331-332 at the Knitting Arts Exhibition, to be held in Philadelphia, at the Commercial Museum, May 12 to May 16 inclusive.

Their representatives will include A. W. Butterworth, president; H. W. Butterworth, Sr., chairman of the board, J. Ebert Butterworth, H. W. Butterworth, Jr., DeHaven Butterworth, W. E. H. Bell, and Wm. Yates.

The Vulcanized Rubber Co., Morrisville, Pa., is operating six days a week in all departments and reports an increase in business over the early spring months.

Colonel and Mrs. Charles A. Lindbergh on April 20 set a record when they flew from Glendale, Calif., to Roosevelt Field, L. I., N. Y., a distance of approximately 2,700 miles, in 14 hours 23 minutes 27 seconds, with only one stop, at Wichita, Kan. With his wife as navigator the colonel flew 180 miles an hour at altitudes ranging from 14,000 to 15,000 feet above the ground. The flight was undertaken to test the theory that express and passenger plane service can be greatly speeded if the planes fly in the higher reaches where the air is thinner and the resistance correspondingly less than at lower altitudes. The Lindberghs wore the electrically heated rubberized suits illustrated and described in INDIA RUBBER WORLD, April 1, 1930, p. 57.

Frank H. Naylor, executive of the Bibb Mfg. Co. plant, Columbus, Ga., maker of tire fabrics, has announced that the mill resumed full-time operation after several months of curtailed production.

The B. F. Goodrich Co., Akron, O., has appointed to its advertising and merchandising staff J. B. Mills, former advertising manager of the India Tire & Rubber Co. and the Lambert Tire & Rubber Co. His headquarters are at Dallas, Tex.

The Dayton Rubber Mfg. Co., Dayton, O., has made C. O. Woody, former district manager of the Hicks Rubber Co., Waco, Tex., its direct factory representative for the state of Texas.

The American Society of Mechanical Engineers, in celebrating its fiftieth anniversary held a meeting on April 7 at Washington, D. C., attended by some of the most distinguished engineers in all parts of the world. The climax of the celebration was reached on April 8 when President Herbert Hoover received the Hoover Gold Medal, to be awarded hereafter at indeterminate intervals for outstanding accomplishments in the engineering field. Other meetings took place at New York, N. Y., and at Stevens Institute.

Huber Expands Carbon Black Technical Facilities

J. M. Huber, Inc., 460 W. 34th St., New York, N. Y., is installing a complete rubber testing laboratory at 602 62nd St., Brooklyn, N. Y. The new laboratory will be devoted exclusively to research problems coordinating the manufacture of carbon black with its use in rubber. The company operates also a general rubber laboratory in connection with its main sales offices in New York, and a production control laboratory at its largest rubber black factory in Borger, Tex.

Emmett B. Reinbold has joined the Huber technical staff and has been assigned to the Carbon Black Research Division, with headquarters at Huber's Brooklyn laboratories. Mr. Reinbold is a graduate of Muhlenberg College and received his master's degree from Cornell University. For the past two years he has been associated with the Testing Division of The B. F. Goodrich Co., Akron, O.

Nathaniel Millman has resigned as chemical engineer with the International Coal Carbonization Co. and is now connected with the Carbon Black Research Division of J. M. Huber, Inc.

U. S. Rubber Co.

F. B. Davis, Jr., chairman of the board and president of the United States Rubber Co., 1790 Broadway, New York, N. Y., has announced that William O. Cutter, director, member of the Executive Committee, and vice president, and for a number of years comptroller of the company, tendered his resignation and sailed recently for an extended trip abroad for rest and recreation. Mr. Cutter had been with the company in various capacities in the departments of accounts and finance for more than fourteen years.

In answer to a stockholder's question at the annual meeting Mr. Davis said: "We can see no present advantage in consolidation with any other rubber company. Our present efforts are being devoted to putting our own house in order."

William DeKraft, chairman of the finance committee declared: "Although we have formulated no plan for refunding the $18,336,000 of 7½ per cent notes due August 1, 1930, we have definite assurance that we will be able to take care of it at the proper time."

Samuel B. Howard and William M. Stevens were elected directors. Other directors were reelected with the exception of Mr. Cutter.

Increased Facilities for C. J. Tagliabue Mfg. Co.

The C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., well-known maker of instruments for controlling the vulcanization of rubber, has announced the acquisition of the American Tobacco Co. property on Park Ave., extending from Nostrand Ave. to Sanford St. in Brooklyn.

The new building, a model of the latest industrial construction, will be occupied about July 1. It is a five-story, basement and pent house, modern concrete, fireproof structure providing approximately 300,000 square feet of floor space, which more than doubles the present factory facilities. From the point of introduction of raw material to the completion of finished products, efficient, mobile, straight-line production has been the watchword in planning the various manufacturing departments.

The executive offices, a large reception room and show room are on the third floor where there is also a cafeteria for the general office and factory employes.

The laboratories and experimental divisions have been given a generous allotment of space. A completely equipped hospital is on the first floor.

The general location of the building itself is fortunate as it is within easy accessibility of rail centers and steamship docks.

MIDWEST

U. S. Rubber Co.'s Director of Purchases

G. M. Tisdale, a native of Maryland, was graduated from the Naval Academy at Annapolis in 1913. He was assigned to the battleship "Utah" as junior ensign and participated in the landing at Vera Cruz

Blank-Stoller, Inc.

G. M. Tisdale

in 1914. He was then transferred to the "Montana," where he was tutored in torpedoes and machine-shop practice. He was a lieutenant, senior grade, training engineers for naval ships, on the "Missouri" when America entered the World War. He served also on the destroyer "Dorsey" on convoy duty and later as chief engineer of the destroyer "Schley." As lieutenant commander he brought this vessel around from the Pacific and then across to the Mediterranean.

In January, 1919, he was made Acting Chief of Staff of the United States High Commission at Constantinople, where he remained until 1920. While in Turkey, he engaged in very important diplomatic work and traveled extensively in Greece, Turkey, and Transcaucasia. During his travels he spent a week at the headquarters of General Denekin to study Russian revolutionary and Russian trade conditions.

On resigning from the navy in May, 1920, Mr. Tisdale accepted a position with the American Fuel Oil & Transportation Co. in connection with the operation of oil tankers. But he resigned in December to enter the employ of the United States Rubber Co., New York, N. Y., as assistant to the general storekeeper. Eight months later he was appointed assistant general purchasing agent. In May, 1929, Mr. Tisdale was promoted to the position of director of purchases.

Rubber Carbon Paper Coating

In a new carbon paper the coating is applied in the form of a volatile solution of natural or artificial rubber, gutta percha, balata, or other isomers, natural or artificial resins, esters, or the like, or mixture of these, with a pigment lake coloring. Softening and vulcanizing agents and accelerators may be added.

United States Rubber Co. Tire Department Activities

Joseph F. O'Shaughnessy has been appointed general manager of the tire department of the United States Rubber Co., Detroit, Mich., according to an announcement authorized by F. B. Davis, Jr., chairman of the board of directors and president of the rubber company at 1790 Broadway, New York, N. Y. Mr. O'Shaughnessy in his new position will have complete charge of all United States tire activities. He was formerly an assistant to the general manager of the tire department, and joined the United States Rubber organization last October when tire headquarters were transferred from New York to Detroit. His entire business career has centered upon merchandising. Prior to joining the rubber company he spent five years in association with Mr.

Joseph F. O'Shaughnessy

Davis, who was elected president and chairman of the company a year ago.

The appointment is effective immediately and was made to allow L. D. Tompkins, formerly general manager of the tire department, to devote his full time to other company activities. Mr. Tompkins, in addition to being a vice president and a member of the executive committee of the organization, is active in the management and operations of the United States Rubber Co.'s plantations in the Far East, which are said to produce nearly four times the crude rubber of all other American rubber manufacturers combined.

Memphis, Tenn., has been designated a new district sales office by the U. S. Rubber Tire Department, to serve as headquarters for branch sales offices in Arkansas and part of Kentucky, Tennessee, and Mississippi. George H. Himes has been appointed manager of this new district by L. M. Simpson, general sales manager. Mr. Himes has been connected with the tire industry for the past eight years and was formerly branch manager for a leading tire manufacturer. He is a graduate of Boston Technical University. Upon leaving school he spent five years in the United States Naval Air Service as a test pilot and flight commander.

H. J. Collier, for twenty years engaged in foreign development work for The B. F. Goodrich Co., Akron, O., and recently resigned, has become affiliated with the United States Rubber Co. Since April 1 he has been with the construction and development division with headquarters at the new Detroit factory.

An intensive campaign against waste was conducted during April at the tire plant. As all known forms of waste are well under control, this campaign was primarily to enlist the creative thought of the workmen by offering cash awards for practical suggestions to reduce unrecognized forms of waste in time, labor, or materials.

This drive was the first of its kind at the plant, although for the past thirteen years workers have been encouraged to submit suggestions for improving conditions or processes. The suggestor receives an award depending in amount upon the value of his suggestion. During the past year over 500 suggestions came from the men on the bench, and 25 per cent were of value, according to M. A. Clark, industrial relations manager.

During the past years, also, a merit system was instituted. The suggestor, besides a cash award, received a merit mark depending upon the value of his suggestion. At the close of the year the eight leading men received bonuses varying in amounts up to $125.

The National Association of Purchasing Agents will hold its fifteenth annual convention in the Stevens Hotel, Chicago, Ill., from June 16 to 19, 1930. The Inform-A-Show will be conducted in conjunction with the meeting.

E. A. Armit, chief chemist of the Mechanical Rubber Co., Chicago, Ill., a division of the United States Rubber Co., has resigned to accept a position as assistant chemist with Van Cleef Bros., Chicago.

Amylene Dichloride—a Rubber Plasticizer

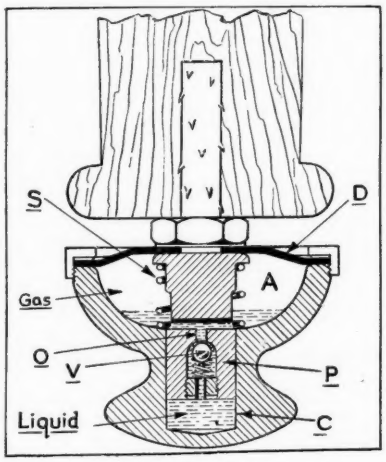
Amylene dichloride has been experimentally known to have much more rapid plasticizing action on vulcanized rubber scrap than either dipentene or xylene. Its suggested application for removal of vulcanized rubber from fabric is as follows:

After fifty-one hours at room temperature, vulcanized rubber immersed in amylene dichloride begins to slough. This action proceeds until the entire sample of rubber is converted into a thick paste. Xylene and dipentene do not produce sloughing under the conditions of the test. The sloughing action of amylene dichloride permits the complete removal of rubber from tire fabric. This is best accomplished by three two-hour digestions with amylene dichloride, screening the fabric between each digestion. A short digestion with 86° gasoline will leave the fabric rubber-free and only slightly discolored.

Furniture Stabilizer and Leveling Device

TABLES and other articles of furniture are frequently unsteady when they stand on warped or otherwise uneven floors or surfaces. In such cases a ready means of giving them a steady footing is very desirable as for example in the case of a billiard table, to name only one article. A stabilizer known as the "Legstead" has recently been made the subject of a patent[1].

The illustration indicates the working parts and method of operation. The weight of the article supported moves the plunger *P* into the cylinder *C*, thereby forcing the liquid from the cylinder through the orifice *O* into the chamber *A*, compressing the gas



The Legstead

in the chamber until a state of equilibrium is reached. The spring *S* is also compressed by the same movement. The flexible rubber diaphragm *D* prevents the escape of the liquid or gas. When the load is reduced, the gas and spring expand, thereby maintaining contact between the floor and support. The simple ball valve *V* is provided with a grooved seating which allows only a slow rate of flow (dependent upon the viscosity) of the liquid, in an upward direction, thus preventing any sudden movement of the plunger when the article is loaded or knocked. When the loading is reduced, the valve opens and allows rapid recovery of equilibrium.

In this device the rubber diaphragm is an essential feature serving to make it entirely leakproof, self-contained, and eliminating frictional resistance between the moving parts. In some models, where it is gripped between metal, the rubber is reenforced with cotton and silk fabric.

[1] British Patent No. 325,656.

OUR BRITISH FRIENDS CAN NOT UNDERstand "why the wearing of galoshes is a matter of course among Americans, whereas in England men prefer to go about all day in sodden leather shoes and revile the elements." Well, Americans know that rubbers give comfort and conserve health, and perhaps they also help their disposition.

PACIFIC COAST

An old observation that the Pacific Coast is one of the first sections of the country to feel a business depression, but usually the first to recover, is apparently being verified by the experience of makers and dealers in rubber goods in that region. Led to expect a dull January with slowly improving trade in February and March, and a more marked upturn in April—they were agreeably surprised last month when business changed decidedly for the better. The let-up in seasonal rains resulted in much activity among tire dealers, just as the long wet spell had helped greatly in clearing away dealers' stocks of rubber footwear and clothing, and resulted in the closing of large contracts by factory representatives for next season's supplies. General building operations are quickening, factories are steadily resuming normal activity, many large-scale contracting jobs are started, and a general impression exists that the measures designed to limit oil production soon will be relaxed, all accounting for better sales of and inquiry for mechanical rubber goods.

United States Rubber Co., Inc., according to J. B. Brady, general manager of the Pacific Division, San Francisco, Calif., has more than held its own in comparison with the first four months of 1929, with business during the greater part of April showing decided snap, especially in tire sales. A careful investigation of conditions throughout this section convinces Mr. Brady that the quiet season has been safely passed and that the outlook is very encouraging. The new line-up of the organization is functioning satisfactorily. Through the new system the efficiency of the branches has been much enhanced. Recent changes in the sales force include the appointment of E. A. Myers, formerly San Francisco branch salesman, as district sales manager, sundries department, Seattle branch; G. W. Gilmer, formerly city salesman of the mechanical department, Salt Lake City branch, as district sales manager of mechanicals at the branch; J. R. Van Pelt's appointment on the staff of J. B. Magee, Pacific Division tire sales manager, as regional representative motor coach and cab tire sales.

The company completed in April the laying of one of the largest rubber tile jobs in the country, 50,000 square feet of flooring in the new Shell Oil Co. building, San Francisco. Other large installations of rubber flooring have been at the new Ford assembly plant and the new mausoleum at Long Beach, Calif.

New warehouses have just been established at El Centro and San Bernardino. Tire Sales Manager J. B. Magee returned on April 16 from a conference with company executives at Detroit, Mich.

American Rubber Producers, Inc., a subsidiary of the Continental Rubber Co., New York, N. Y., engaged in planting 2,500 additional acres in the vicinity of its guayule experimental station at Salinas, Calif., is meeting with the ready cooperation of farmers who are anxious to try out guayule on parts of their land, which four-year crop, they estimate, will pay better than several other products. The company had figured on a minimum expansion of 2,000 acres a year. At the 20-acre nursery over 20,000,000 plants have been developed from seed by Wm. B. McCallum, botanist in charge, and a large part can now be transplanted.

President George H. Carnahan and Vice President David W. Spence, chief chemist, recent visitors at the Salinas station, have expressed much satisfaction with the developments. Vice President Frederic W. Taylor and General Manager J. M. Williams left on April 21 for Tucson, Ariz., near which city the company has a large tract on which it has been making experiments in growing various rubber-bearing plants and in other agricultural work.

Mohawk Rubber Co. of New York, Inc., according to W. G. Fitzgerald, Pacific Coast manager, 560 Seventh St., San Francisco, Calif., has been enjoying a steady improvement in sales since the first of the year, gaining especially during the past month. The company has just closed a contract for distributing its products with a company operating a chain of high-class service stations in San Francisco.

Fisk Tire Co., Inc., having discontinued its factory branch at 930 Second Ave., Spokane, Wash., will distribute through the Green-Goettel Co. of that city.

Samson Tire & Rubber Corp., Los Angeles, Calif., reports satisfactory improvement during the past month in production and distribution, and as a result operations are being speeded up at the new factory. The management is gratified with the growth of business not only in the Pacific region and Midwest but also the Atlantic territory, where many new dealer contracts have lately been made. President A. S. Schleicher recently returned from an extensive eastern trip and states that he found decidedly encouraging trade conditions nearly everywhere. He expects a marked revival soon in the tire trade.

West American Rubber Co., Los Angeles, Calif., has added a new feature to its factory, which is appreciated by the various tire, reclaim, and other rubber concerns in the city. It has installed a Farrel-Poole roll grinder, 180 inches long, capable of truing mill and calender rolls up to 28 inches in diameter.

Western Sulphur Industries, Inc., San Francisco, Calif., which has been supplying much of the sulphur used by Pacific Coast rubber manufacturers, has been merged with the Agricultural Chemical Works, 905 Macy St., Los Angeles, Calif.

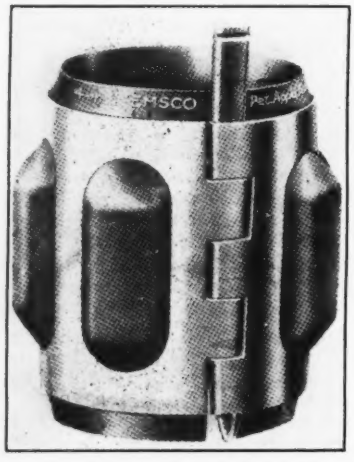
Dayton Rubber Mfg. Co., Dayton, O., will build a branch factory in Los Angeles, Calif., early in 1931, it is now announced. A recent survey of the field by the Dayton vice president, D. W. Warden, convinced him of no immediate need for a factory. It is understood that the determining factor will be the passing of the sales quota set for the Coast distributers. The latter report that excellent progress is being made, Dayton sales having been advancing steadily since the first of the year, with April sales being the best in the company's experience.

Rube Chase, direct factory representative for Dayton, is once more back in his old territory in California. He was temporarily transferred to eastern territory to give merchandising assistance to a number of large distributers who recently contracted to handle Dayton Thorobreds.

Pennsylvania Rubber Co., Jeannette, Pa., conducted a regional sales conference on April 14 at the Los Angeles, Calif., branch, arrangements having been made by Branch Manager H. H. Boucher and Madden & Conroy, leading distributers. Of special interest was the presence of W. O. Rutherford, president of the Pennsylvania company, who has been making a personal study of trade conditions. He stated that tire replacement business for 1930 would greatly exceed that of 1929, that the potential buying power for this year is especially helped by the fact that while the industry had planned to market 52,000,000 tires in 1929, only 47,000,000 were bought, thus leaving 1930 to supply the difference of 5,000,000 tires in addition to the usual current requirements.

Oil Drilling-Pipe Protector

IN BORING oil wells the drilling stem line works within a hydraulic pipe or casing and, between the two, thin mud is forced by a slush pump, while the drill is turning, so as to cool the drill, plaster up the hole, and force the cuttings to the surface. Various devices have been made to shield the drill pipe and casing during the boring, but many of them interfere more or less with the forcing down or return of the slush. Such objection is claimed to be overcome with the Emsco Free-Circulation Protector, a cylindrical C-shaped steel cage, in which is set a tough, oil-resistant, 5/16-inch thick rubber element having six protruding offsets or bumpers. This device can be clamped easily on a drill pipe. It is claimed to be non-slipping, to afford protection not only to pipe, casing, tool joints, and collars, but also to avert back pressure and mudding up when potential oil sands are running in. E. M. Smith Co., 637 S. Clarence St., Los Angeles, Calif.



Emsco Drill Pipe Protector

Wright Rubber Products Co., Racine, Wis., represented by G. M. Anderson, 510 Fine Arts Bldg., Los Angeles, Calif., has made considerable progress since its advent on the Coast three years ago in laying rubber sidewalks and rubber-tile flooring. Large sidewalk jobs done recently in Los Angeles have been two frontages at the new Ninth and Broadway building and the Richfield Oil Co. building, and in front of the Banks, Huntley building. Contracts has been made for a rubber sidewalk on two sides of the new Southern California Edison building and for the new Russ building in San Francisco. Indoor tiling has been laid in the new Federal building, Bullock's Wilshire store, and the Willard George fur shop, and is about to be installed in the new California Clubhouse, new Southern California Telephone building, and the Los Angeles Stock Exchange.

Sunset Battery Corp., Ltd., has been incorporated in California to manufacture storage batteries of rubber and composition. The capital is 15,000 shares common and 5,000 shares preferred. Directors are James Anderson, Jr., H. G. De Bow, and M. V. Anderson. Office and works, 2603 S. Main St., Los Angeles, Calif.

Pacific Goodrich Rubber Co., Los Angeles, Calif., took active part in the formal opening of the Western Air Express station at Alhambra, Calif., on April 17, at which addresses were made by Governor Young, Will Rogers, and other notables. A star attraction was Lee Schoenhair, Goodrich air pilot, winner of six world's records, who brought from Akron the Goodrich Lockheed-Vega plane, "Miss Silvertown." The company also treated its employes to a midnight performance at Loew's State Theatre, Los Angeles, on April 19.

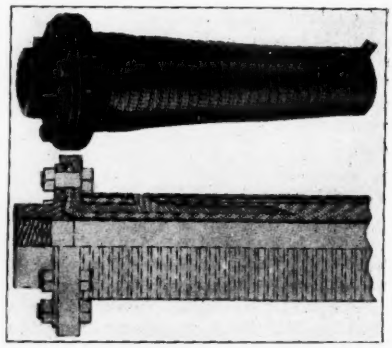
In the first week of April the company launched one of the three units of the Goodrich "Silver Fleet," which, like the fleet which did over 30,000 miles in 1929, is going to give Silvertown tires a zig-zag, cross-country, gruelling road test that may total 80,000 miles before the three units return to their bases, the other two being in Akron, O., and Miami, Fla.

Goodyear Tire & Rubber Co., Los Angeles, Calif., was host on April 17 to a delegation from the parent plant at Akron, O., including R. S. Wilson, vice president and general sales manager; C. T. Hutchins, advertising manager; Fred L. Morgan, automobile tire department manager; Karl L. Dalsky, assistant manager of truck and bus tire department; and H. E. Blythe, assistant to President Litchfield. The party has been making a nation-wide tour surveying business conditions, and the members say the outlook justifies much optimism. John K. Hough, California sales manager, and D. W. Sandford, local branch manager headed the reception committee.

President P. W. Litchfield, of The Goodyear Tire & Rubber Co., Akron, O., pleasantly surprised Southwest salesmen on April 17 by appearing in Los Angeles, Calif., at a conference being conducted by Vice President and General Sales Manager R. S. Wilson. He had been inspecting the 37,000-acre Goodyear plantation in Arizona, from which 5,500 bales of long-staple cotton are expected this year. Afterward Mr. Litchfield enjoyed a cruise over the city in the Goodyear blimp, "Volunteer," and studied the new free-ballooning training of student air pilots. Mr. Litchfield, as chairman of the board, California Goodyear company, was re-elected at the annual meeting in April, as were also the other directors and the executive officers.

Rotary Hose Built Into the Coupling

IN a new type of rotary hose unit, the Warco, used in oil drilling, the familiar heavy clamps are dispensed with; yet greater security is said to be obtained against bursting. The hose, having round and half-round armor for increased flexibility, is built into a coupling of novel design without reducing its inside diameter and is molded over the face of the flange, thus forming a rubber seal between flange and fitting. With uniform internal diameter of hose and coupling, turbulence back of coupling and back pressure on hose are said to be averted and the coupling protected from contact with fluid. With a Warco dual rotary hose header and two lengths of such 1½-inch hose, it is said that a pressure of 3,000 pounds can be carried. The West American Rubber Co., Los Angeles, Calif., is the manufacturer.



Warco Steel Clad Rotary Hose with Lamb Coupling

CANADA

There has been a wide sale of garden hose since the season opened. Retail stocks were low at the end of the 1929 summer season; so for 1930 buying has been good. Prices are unchanged. May weather conditions will have much effect on repeat orders.

Prices on red sheet packing are reduced. On first grade packing the new price is 40 cents in full rolls and 48 cents in less than roll orders; while second grade is quoted respectively at 30 and 38 cents. One grade of spiral packings has dropped from 60 to 57 cents a pound.

Importation of golf balls into Canada has taken a big jump, indicating that the ancient game is growing more popular than ever.

Wholesalers have reduced prices on rubber heels.

A 1930 development in women's rubber footwear is the novelty light rubbers in watered silk finishes. Most feature a single dome fastener, though some laced fastenings have recently appeared.

Dominion Rubber Co., Ltd., Montreal, P. Q., just a year ago introduced "Blue Bar" rubber footwear, and the trade was quick to realize the significance of the blue rubber bar as a mark of merit in heavy rubber footwear. The firm, anticipating a wider demand, is launching an intensive advertising campaign directed to farmers, miners fishermen, and lumbermen.

The company is sponsoring also the Fleet Foot Athletic Club for Boys and Girls. Dealers throughout Canada have been supplied with application blanks for the club, and one is given to every boy and girl who buys a pair of Fleet Foot Shoes. Each applicant receives from the manufacturer a membership button, a certificate, and a monthly copy of *Sports Review.* Dealers are furnished with cut-outs, window display cards, streamers, etc. A most extensive advertising campaign also is in progress.

J. W. Green, of the Dominion company, recently has been appointed a two-year member of the board of directors of the Quebec Division of Canadian Credit Men's Trust Association, Ltd.

Made In Canada Show. The second national exhibition of the Produced in Canada Association will take place at the Stadium, Montreal, P. Q., during the week of November 3. The executive committee of the Quebec Division of the Canadian Manufacturers' Association again will sponsor the show.

C. A. Joslin, of the Panther Rubber Co., Ltd., Sherbrooke, P. Q., has been elected a member of the executive council of the Sherbrooke branch of the Canadian Manufacturers' Association.

Canada Golf Ball Co., Ltd., Toronto, Ont., now manufactures a new golf ball known as the Can-Pro, made in both British and United States sizes and weights. It will be bigger in size and will also have the new popular colored group dots.

W. E. Wing, for a year and a half in charge of the Foreign Footwear Department, International B. F. Goodrich Co., New York, N. Y., U. S. A., has resigned to join the Northern Rubber Co., Ltd., Guelph, Ont., as sales manager. Mr. Wing needs no introduction to the Canadian trade, however, having formerly spent twenty years in an executive capacity with the Kaufman Rubber Co., Kitchener, Ont. He will reside in Guelph.

Gutta Percha & Rubber, Ltd., Toronto, Ont., last month was visited by His Excellency Right Hon. Viscount Willingdon, Governor General of Canada, on his first inspection of a rubber plant. His Excellency, who was accompanied by Col. K. R. Marshall and Eric Mieville, aides-de-camp, was received by the following company directors: Mrs. H. D. Warren, vice president and chairman of the board; C. N. Candee, president; J. H. Coffey, Jr., managing director; C. S. Band, vice president; E. A. and Harold D. Warren; and R. G. Stewart, factory manager.

The company's assistant manager of the shoe department, Chadwick Mather, left on a cross-Canada trip during which he will visit all the company's branches from Winnipeg to the Coast.

Ames Holden McCready Rubber Co., Ltd., moved its head office from Montreal to Kitchener, Ont. The firm's sales manager, N. M. Lynn, at present is covering the Western Ontario territory and will be absent for a month or more.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
*44,391	Hose and pump diaphragms	The Hague, Netherlands
*44,430	Rubber bands	Guayaquil, Ecuador
†44,431	Packings	Mexico City, Mexico
‡44,461	Automobile step plate mats	Vancouver, Canada
*44,472	Unvulcanized sheet rubber	Edinburgh, Scotland
†44,481	Balloons	Cairo, Egypt
†44,519	Technical goods	Prague, Czechoslovakia
†44,523	Raincoats	Stockholm, Sweden
†44,525	Rubber goods	Habana, Cuba
*44,535	Boots and shoes	Glasgow, Scotland
†44,538	Mechanical goods	Lausanne, Switzerland
*44,539	Tire-repair gum	Rheims, France
†44,540	Reclaimed rubber	Hamburg, Germany
‡44,571	Overshoes	Frankfort, Germany
†44,605	Aprons, hot water bottles, and galoshes	Chemnitz, Germany
†44,607	Raincoats, mackintoshes, etc.	Skodsborg, Denmark
†44,652	Heels	Cali, Colombia
*44,653	Bathing caps and shoes	Liverpool, England
†44,678	Balloons	Alexandria, Egypt
†44,697	Bathing caps and shoes	Johannesburg, South Africa
*44,727	Boots and aprons	Rio de Janeiro, Brazil
†44,734	Druggists' sundries	Alexandria, Egypt
†44,736	Tires and tubes	Paris, France
†44,747	Fabrics	Paris, France
†44,754	Garden hose	Wellington, New Zealand
†44,800	Tires and tubes	Beirut, Syria
†44,819	Packings	Neuilly, France

*Purchase. †Agency. *† Purchase and Agency. ‡ Either.

General Manager Canadian Seiberling

A forceful factor in the remarkable advancement of Seiberling business in Canada has been Clifford A. Jones, who, since the young company was organized, has been vice president and general manager of the Seiberling Rubber Co. of Canada, Ltd., Toronto.

Born in Akron in 1884, Mr. Jones got his early education in the grammar grades and graduated from the Akron High School in

C. A. Jones

1902. Rubber having attracted him, during the three succeeding years he learned much about its production and merchandising while in the cost-accounting department of The B. F. Goodrich Co., and, in fact, so much that he qualified readily when, in 1905, he was offered the position of assistant factory superintendent of the Pennsylvania Rubber Co., Jeannette, Pa. After five years' experience there he went back to Akron, where for ten years he was salesman and later assistant sales manager of mechanical rubber goods with The Goodyear Tire & Rubber Co.

Seiberling interests were quick to perceive his capabilities, and in 1920 he accepted an offer as branch manager and subsequently became assistant sales manager of the Akron concern, retaining the latter position until 1927 when he was entrusted with the responsibility of starting the new Seiberling plant in Toronto, Canada, March 1, 1927. The setting up since then of over 1,200 dealers with exclusive franchises in some 2,100 Canadian towns and cities, the considerable increase in export trade in tires and other rubber goods, as well as the rapid plant expansion are credited very largely to the energetic vice president.

Still young, Mr. Jones is one of the Seiberling "Old Guard," having been a valued aide since he left Goodyear's ten years ago to cast his lot with the "Napoleon" of the rubber industry. Thus has he been with only three concerns in his twenty-eight years' activity.

Mr. Jones finds congenial diversion in various social activities. He is a Mason, Knight Templar, Shriner, Knight of Pythias, Rotarian, and a member of the Granite Athletic Club, and the Islington Golf Club of Toronto.

His business address is Paton Road, and his home is in Toronto.

Obituary

Noted Financier

THE industrial world suffered a severe loss on March 27. For Nicholas Frederic Brady, chairman of the board of the New York Edison Co. and director of half a hundred corporations including the United States Rubber Co., ill since last September of arthritis, died on that day at his home, 910 Fifth Ave., New York, N. Y. At the time his wife and other members of his family and several lifelong friends were at his bedside.

Mr. Brady was born at Albany, N. Y., on October 25, 1878. He was graduated from Yale in 1899. Then he began his business career with the Edison Co., a career marked by outstanding successes and noteworthy accomplishments.

Besides his numerous business connections, he was affiliated with many art, athletic, religious, and scientific associations. Mr. Brady was one of the foremost Catholic laymen in this country, and both he and Mrs. Brady are renowned for their innumerable philanthropies.

Howard G. Goodwin

HOWARD G. GOODWIN, formerly secretary-treasurer of the Independent Rubber Co. and later building inspector for Akron, O., recently died after a long illness. Mr. Goodwin was sixty-four years old and had not been active in business since suffering a stroke last July. Funeral services were held on April 2 at Billow's Chapel, and interment was in Glendale Cemetery.

Mr. Goodwin was a graduate of Purdue University. He is survived by his widow, a son, and two sisters.

Farrel-Birmingham Executive

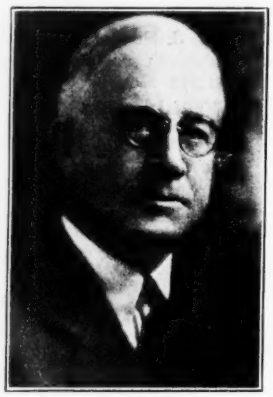
MANY mourn the passing of Francis Downs Wanning, vice president of Farrel-Birmingham Co., Inc., Ansonia, Conn., who died on April 7 at the New Haven Hospital after an illness lasting six months.

His successful business career has been devoted to the Farrel-Birmingham Co. and its predecessor, the Birmingham Iron Foundry, of which his father had been president. Mr. Wanning joined the latter organization on October 1, 1894, beginning, as secretary, in the engineering department. Later he became vice president and general manager. When the Farrel Foundry & Machine Co. merged with the Birmingham Iron Foundry in 1927 to form the present corporation, Mr. Wanning was chosen vice president.

He was born in Shelton, Conn., on March 11, 1873. He went to the Derby High School and then to Yale University, graduating in 1894. After commencement he embarked upon a four-month trip to Europe before entering the commercial world.

Several public utility companies and local civic groups have benefited by his association with them. Besides, he was affiliated with prominent social and athletic clubs. He was a member of the Second Congregational Church, Derby.

On March 28, 1908, he married Rose Andrews, and they have three sons. Mr. Wanning's parents and a sister also survive him. To all of them the heartfelt condolences of the trade are extended.



F. D. Wanning

Funeral services were conducted by Rev. Alfred W. Budd at the Wanning home, 30 Fairmont Place, Shelton, on April 9. Burial was in Oak Cliff Cemetery, Derby. At that time numerous friends, relatives, and business associates as well as Farrel-Birmingham employes paid their last respects to their departed leader.

Wm. H. Schulz

WILLIAM H. SCHULZ, 49, of 1314 William St., Trenton, N. J., superintendent of the cotton hose department of Whitehead Bros. Rubber Co., Trenton, died on March 17, following a long illness. He had been connected with the rubber industry since he was a boy, having been formerly employed by the United & Globe Rubber Co., Murray Rubber Co., and the Woven Steel Hose & Rubber Co., all of Trenton; the Quaker Rubber Co., Philadelphia, Pa.; and the Hewitt Rubber Co., Buffalo, N. Y.

Mr. Schulz was born and raised in Trenton. He is survived by his widow, four brothers, and three sisters. Interment was at Trenton.

Ralph A. Landers

RALPH A. LANDERS, president of the Landers Corp., Toledo, O., and a director of The Commercial Savings Bank & Trust Co. of Toledo, died last month at his home, Ottawa Hills, O.

Mr. Landers, born in Somerville, Mass., on September 23, 1873, was associated with his brothers in the business of the Landers Brothers Co., Boston. In 1904, with little more knowledge of Toledo than that it commanded an excellent railroad position, he came to this city and established a branch factory. The company later extended its business and assumed the name of the Landers Corp., with Mr. Landers as president.

He was very well known in the auto fabrics industry, a Mason, and a Rotarian of the highest standing. His kindly spirit and charitable disposition made hosts of friends for Ralph Landers, whose untimely passing will be deeply felt in the rubber trade.

He is survived by his widow, a daughter, a son and his wife, and a brother. Burial was at Woodlawn Cemetery.

Three-Spoke Steering Wheel

The public is now responding favorably to the idea of a three-spoke steering wheel on several outstanding American cars of large production. The development of the Husted safety steering wheel, having a one piece tubular, pressed steel core, enclosed in hard rubber has given the wheel that wide margin of strength that makes the three-spoke design both practical and safe. It is made by The American Hard Rubber Co., Akron, O.

Statement of INDIA RUBBER WORLD

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of INDIA RUBBER WORLD, published monthly at New York, N. Y., for April 1, 1930.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the Business Manager of the INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: publisher, Federated Business Publications, 420 Lexington Ave., New York, N. Y.; editor, Wm. M. Morse, 420 Lexington Ave., New York, N. Y.; managing editor, Wm. M. Morse, 420 Lexington Ave., New York, N. Y.; business manager, E. M. Hoag, 420 Lexington Ave., New York, N. Y.

2. That the owner is: Federated Business Publications, Inc., Edward Lyman Bill, Inc., Bill, Brown & Bill Pub. Corp., Caroline L. Bill, Raymond Bill, Edward Lyman Bill, Randolph Brown, J. B. Spillane, all located at 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 25th day of March, 1930.

[SEAL] WM. A. LOW.

Notary Public, N. Y. Co. No. 473, Reg. No. 1L337. Certificate filed in Queens Co. No. 1087. (My commission expires March 30, 1931.)

The Rubber Industry in Europe

GREAT BRITAIN

Tapping Suspended During Month of May

The Rubber Growers' Association reports that the number of companies agreeing to stop tapping in May has been exceptionally large so that the minimum of 70 per cent support which had been stipulated as necessary before the plan could be put into operation has been exceeded. So far assents from European owned estates in the Netherlands East Indies and in British rubber producing territories have been well over 80 per cent, and in addition advices from Malaya indicate that very substantial support from the Asiatic producers is to be expected. The scheme, therefore, becomes operative, and it is hoped that the total assents will represent a tonnage equivalent to more than half the world's production.

Reports from Holland regarding support from Dutch and other European companies state that of 134 rubber-growing companies controlled from Holland, 111 have joined the scheme, representing an annual production of 43,441 tons. Of 51 companies controlled from the Dutch East Indies, 23 have joined, their annual production being 1,810 tons. Belgian, French, Swiss, and German controlled companies having a production of about 16,300 tons have also joined. The assenting companies thus represent 61,551 tons.

Five companies, three Dutch and two foreign, have refused to join, and these with two other Dutch companies who are unable to join as they have sold forward their 1930 production, represent a total output of 2,734 tons. No decision has been received from 20 smaller Dutch companies with an output of only 411, or from 26 Dutch East Indies controlled companies with a production of 4,505 tons; nor have government-owned plantations with production of 4,300 tons given any decision.

So far, therefore, 61,551 tons of a total Dutch, French, Belgian, Swiss, and German production of 73,501 tons, have joined the scheme, which means nearly 84 per cent support. The Dutch assenting companies have been officially informed that in cooperation with the Rubber Growers' Association stoppage of tapping during the month of May will be effective.

Further reports from Amsterdam show that at a meeting of European and native rubber growers held at Bandjermasin, Dutch Borneo, it was agreed to stop tapping in May. A committee was elected with the instruction to appoint propagandists who will urge all native growers to cooperate in the restriction scheme.

The *Financial Times* learns that French rubber companies having domicile in Paris will in all probability join the British-Dutch restriction scheme. The French rubber companies in Indo-China have practically all given their approval to the tapping holiday.

Tensile Strength of Rubber

It may be remembered that in 1927 rumors afloat regarding the supposed decrease in the tensile strength of plantation rubber took such a form that the *India Rubber Journal* decided to take up the matter and published a review of data obtained from manufacturers and experts. The Rubber Experiment Station of Buitenzorg, Java, gave a review of figures for Java for the years 1923-26 from which it was seen that so far from deterioration in tensile strength, there was actually an increase.

In a recent issue of the *India Rubber Journal*, O. de Vries and R. Riebl, of the Rubber Experiment Station, Buitenzorg, supplement these figures with averages for 1927-29, and these indicate a steady increase in tensile strength and no deterioration whatever. Instances of variability found were explained to be due partly to errors of determination of tensile strength and only partly to actual differences in the intrinsic quality of the rubber.

In explanation of the causes of the complaints regarding tensile strength, the writers suggest: (a) faulty testing methods; (b) the inclusion of fair amounts of native and Chinese-grown rubber in blended lots, in which cases also it is customary to erase the names of the original plantations from the packages, so that a not inconsiderable amount of inferior rubber may have been passing as plantation rubber; and finally (c) the custom still prevailing in certain instances, of determining tensile strength for standard time of cure instead of for standard state of cure.

Granite Rubber Paving Flags

Attention of those interested in rubber has just been called to a novel type of flagging for roads which it seems has already been successfully used at Skipton, Burnley, Stockport, Barnard Castle, Edinburgh, and is now being given a test at Blackburn. These flags consist of granite concrete reenforced with steel meshwork to which are attached rubber strips. These rubber strips are placed in the flag molds so that they project ⅛-inch above the concrete surface. The advantages of the new type of flags appear to be that they can be laid on any type of gradient with perfect safety and that they are non-slippery. It is further claimed that the design and construction of the flags render it impossible for the rubbers to come out as they are not only practically keyed into the concrete but are also held in place by the metal reenforcement.

The flags are being produced by the Shap Granite Co., Ltd., Shap, Westmoreland, by arrangement with the Hazel Grove Rubber Co., Ltd.

Institution of Rubber Industry

A new section has been formed, namely, the West of England Section of the Institution of the Rubber Industry, the membership of which is as follows: Chairman, Sir Herbert Blain, vice president, Avon India Rubber Co., Ltd.; vice chairman, S. S. Pickles, chief chemist, Geo. Spencer Moulton & Co., Ltd.; secretary and treasurer, T. L. Garner, chief chemist, Avon India Rubber Co., Ltd.; Committee, F. W. Hinde, managing director, Avon India Rubber Co., Ltd.; S. L. Hewitt, Avon India Rubber Co., Ltd.; W. C. Holbrook, Trowbridge Rubber Co., Ltd.; A. M. James, The South Wales Brattice Cloth & India Rubber Co., Ltd.; C. Kendall Jones, Avon India Rubber Co., Ltd.; C. C. P. Lane, Avon India Rubber Co., Ltd.; F. M. Panzetta, Trowbridge Rubber Co., Ltd.; Major C. R. Quartley, Geo. Spencer Moulton & Co., Ltd.; Smart C. Solomon, Geo. Spencer Moulton & Co., Ltd.; H. Turner, Geo. Spencer Moulton & Co., Ltd.; F. Webster, Avon India Rubber Co., Ltd.

Company News

Wilkinson Rubber Linatex, Ltd., is a private company formed to manufacture and deal in linatex, rubber flooring, and rubber goods of all kinds, and to adopt an agreement between the Wilkinson Process Rubber Co., Ltd., and Harrisons & Crosfield, Ltd. The company, which has a capital of £2,500 in £1 shares, is established at 1-4 Great Tower St., London, E. C. 3.

The Goodyear Tire & Rubber Co. (Great Britain), Ltd., reports profits of £176,292 for 1929, against £84,662 for 1928, before providing for interest on debenture stock. The factory operated to full capacity on an average of 5½ days a week throughout the whole year, the average daily output being 3,000 tires. The net profit on trading was £159,533, more than double the amount in the previous trading period when £75,983 was booked. To this must be added interest, rent, and sundry receipts, together £16,759, making a total of £176,292. After deducting interest on debenture stock (£52,000), preliminary ex-

penses and proportion of debenture issue expenses, and discount written off (£10,004), a net profit of £114,288 is retained.

British Moulded Hose, Ltd., has issued £100,000 new capital in 7 per cent cumulative preferred shares of £1 each, redeemable at £1—2 shillings at any time after December 31, 1934, either in whole or in part. This company was formed last year for developing the manufacture of braided and molded rubber hose in England as now manufactured by the Electric Hose & Rubber Co., Wilmington, Delaware, U. S. A., and the Leyland & Birmingham Rubber Co., Ltd., Leyland, England. All of the 100,000 £1 common shares are held by the two above companies, which guarantee the preferred dividend. Extensive factory buildings, fully equipped, have been acquired at Watford, Herts, and are now in operation. It is expected that the agreements entered into with the American and English companies and other large concerns will yield £250,000 for the first full year's working, leaving a net profit of 10 per cent to the company.

GERMANY

The Leipzig Fair

The Leipzig Spring Fair is generally considered a good business barometer, and the present financial and economic situation in Germany being what it is, exhibitors were very modest in their expectations of results. They were, therefore, agreeably surprisd when it appeared from the outset that the number of visitors from other parts of Europe was going to be exceptionally large. To be sure, the business transacted was not exactly in proportion with the unusually large number of visitors; nevertheless on the whole exhibitors were satisfied.

If the attendance of foreigners was good, the same cannot be said for German consumers. This is explained by the cautious attitude among German buyers, and by the fact that local firms are always being visited by manufacturers' representatives.

Business was not uniformly good for the rubber industry. The surgical branch received much attention, but few important transactions were recorded. On the other hand articles of dress, particularly aprons, did quite well. The demand for aprons covered not only the substantial, simple utility article, but fancy goods also. German toys, novelties, and jokers found much favor, and many export deals went through. The high tariff in several foreign countries greatly hampers the German export toy trade. Manufacturers of technical goods showed little interest in the fair and the number of firms represented was considerably lower than last year.

It may be said that results indicate improving business and more favorable prospects.

Sponge Rubber in Ceramics

In the manufacture of earthenware and porcelain articles sheets of sponge rubber and natural sponge are used to wipe off the glazing mixture from the bottom of the articles. Sponge rubber for this purpose must meet certain requirements. It should not be too soft, but if too hard, the suction power is impaired. Finally the important problem of the size of the pores must be considered.

The *Gummi Zeitung* publishes opinions of five experts regarding the comparative merits of sponge rubber and natural sponge. Only one expert said that sponge rubber is as good as the natural article. Of the others, three agreed to the durability of rubber sponge, but it was also claimed that the rubber product could not be used for the finest grade of porcelain and earthenware goods owing to its coarseness as compared with the delicate and extremely fine pores of the best Greek sponges.

Deutsche Kabelwerke A. G.

The directors of the Deutsche Kabelwerke A.G., Berlin-Lichtenberg, have decided to propose a 6 per cent dividend on common and preferred shares, at the forthcoming general meeting to be held about the middle of May. In 1927 and 1928 no dividend was declared. Expenses during the year were 2,679,507 marks against 2,589,393 marks the year before; interest and taxes required 876,666 marks against 704,769 marks; and the social charges, 197,558 marks against 176,091 marks. After writing off 583,420 marks for various purposes, a balance of 983,560 marks remained, in which is included a carry-forward of 317,615 marks. The concern also has interests in the Deka Pneumatik G.m.b.H. and the Julius Friedlander Gummiwarenfabrik G.m.b.H., and it is reported that after writing off considerable amounts, these firms will distribute 10 per cent in dividends. The policy of the government and municipal authorities in limiting orders affected the business of the Deutsche Kabelwerke A.G. during the latter part of the year.

POLAND

It is reported that negotiations have been completed between the Pepege (Polski Przemysl Gumowy) in Graudenz and the French rubber manufacturing concern Hutchinson, according to which the Polish firm is accorded credit to an amount of $2,000,000. The Polish firm produces galoshes and other rubber footwear, tires and tubes for bicycles, and a variety of technical articles.

The protective tariff in Poland has given a very strong impetus to the development of the rubber industry in that country. Toward the end of 1929, 7,000 persons were employed in 29 rubber factories. Up to the present, 73 per cent of the invested capital has been of Polish origin.

The Polish rubber industry may be divided into four groups: the first, including the Pepege, comprises 15 factories employing about 6,300 factory and office workers, the output including footwear of all descriptions. In 1927-1928 this group produced on an average some 2,000,000 pairs of rubber shoes and snow boots, 500,000 pairs of sports shoes, 150,000 coats, 2,000,000 meters of rubberized fabric, 300 tons of rubber bands, 100 tons of medical and surgical articles, 400 tons of technical goods, etc.

The second group includes six factories which produce mainly tires and erasing rubber. Factories belonging to the third group cater chiefly to the electro-technical industry. Finally the fourth group, comprising seven factories, gives work to 550 people and produces annually more than 5,000,000 rubberized bands of cotton, silk, etc. French capital is interested in this group.

HOLLAND

Holland's imports of plantation rubber during 1929 were 5,993 tons as against 4,128 tons. At first glance these figures would suggest a considerable increase in the consumption of rubber in this country. But further on in the statistics we find that the reexports of crude plantation rubber during the year under review increased from 1,787 to 2,808 tons, so that in the end the increase in consumption is found not to have been exceptionally large.

Among the imports of manufactured goods we find: automobile tires, 215,679 against 194,894; tubes for automobiles, 165,017 against 155,893; tires for other vehicles, 1,210,602 against 1,477,205; and tubes, 1,281,960 against 1,414,731. There was a large increase in the shipments of rubber footwear into the country, the 1929 figures having been 1,789,987 pairs against 1,364,841 pairs. Belgium and then Germany supplied the greater part of these goods. The demand for Dutch tires evidently took a spurt in 1929, for there was an increase in tire exports from 1,730 to 3,969.

On the other hand, there was a slight decline in the exports of carcasses for tires of other vehicles, the number having been 804,037 against 866,727. But tubes for these tires increased from 603,876 to 809,893. Again a very marked decline was to be noted in the exports of rubber footwear, the comparative figures having been 132,405 pairs in 1928 and 45,022 pairs in 1929.

International Association for Rubber and Other Cultivations in the Netherlands East Indies has moved its office from 38 Heerengracht, The Hague, to 5 Nieuwe Doelenstraat, Amsterdam, Holland. The telephone number is 49,424.

European Rubber Novelties

Among European rubber novelties are: bath tub headrests of sponge rubber with suction cups, sponge rubber cushion seats reenforced with a tough skin for cricket or ball games, golf practice mats with self-erecting attachments to be struck with a club, inflatable safety bathing garments, and sponge rubber automobile upholstery reenforced with embedded coiled springs.

RAYMOND B. PRICE, A FORMER VICE president of the United States Rubber Co., New York, N. Y., U. S. A., is residing permanently in Paris, France.

The Rubber Industry in the Far East

NETHERLANDS EAST INDIES

Native Rubber Industry Developing Rapidly

Publicity is given in the local press to an article by Dr. F. W. T. Hunger on native rubber. When he returned to Holland from a trip to the Dutch East Indies in 1922, at the height of the first slump, he wrote to the *Algemeen Handelsblad* concerning the condition of the rubber industry and gave as his opinion that European estates overproduced, and an important native rubber industry was developing, and he warned against this. But he was ridiculed. Now eight years later, he is proven correct. In his present article he examines the development of the native rubber industry and compares it to the copra industry. When fancy sun-dried copra was in great demand for making vegetable fats, a number of European companies formed to produce coconuts. But before long, as a result of improved technology, manufacturers found the less attractive native copra suitable for the best grades of margarine, and today fancy grades of copra fetch little more than inferior qualities, similarly with rubber. Again, because of improved technology the rubber manufacturer finds that the high-grade European-grown rubbers can in many cases be replaced by remilled rubber. The writer refers to the opinion of others that prices will sink still lower and then native producers, supported by Chinese dealers and manufacturers of remilled rubber, will be able to go on tapping. Should anything like this really happen, most European rubber estates would have to work at a loss, and the weakest would drop out. This would improve matters for the remaining European estates, but only for a time, because a constantly developing native industry could after a while again reduce European competition. Dr. Hunger does not state outright that the rubber industry will thus become native just as coconuts, but he does not consider such an occurrence impossible. He points out that if natives in other parts of the Dutch East Indies should take up rubber cultivation with the same enthusiasm as has been done in certain districts of Sumatra and Borneo, then the development so far may well turn out to be but the *commencement* of a native rubber industry.

He refers to the efforts of Mr. Marinus to bring about cooperation between Dutch companies and native producers on a basis of equality in connection with restriction, but doubts that such cooperation will be won. For the native planter, seeing his European competitor in difficulty, will not care to cooperate with him but will prefer to work with the Chinese dealer and remiller who have always supported the native.

Relation Between Bore of Latex Tubes and Yields

About two years ago Herbert Ashplant, then directing rubber research in South India, startled the rubber planting world with his theory of the relation between the bore of latex tubes and the yielding power of the trees, by which high yielding trees could be discovered while they were yet in the nursery stage.

Briefly stated, Ashplant's main points are:

1. That a very striking correlation exists between the yield power of Heveas and the diameter of the latex tubes, a correlation much better than the relation between the number of latex rings and the rubber yield.

2. That a Hevea tree with large bore latex tubes in the bark also has large bore tubes in the leaf stalk.

3. That the size of the diameter of the latex tubes in an individual tree is constant during the entire lifetime from the age of six months up, and that this is hereditary.

In the March, 1930, issue of the *Archief voor de Rubbercultuur*, Dr. A. Frey-Wysseling publishes an account of his investigations of this theory.

Ashplant, in spite of repeated promises, has so far not given in detail his method for measuring the latex tubes, and an independent method had to be worked out. A large number of measurements were made on high-grade trees, known crosses, bud-grafted trees, and kampong trees. As a result Dr. Frey-Wysseling stated that Ashplant's third point, regarding the constancy of the tube diameter from the sixth month on, and the heritability of the type of diameter, could not be checked since years of investigation would be required. The second point, that trees with wide bore tubes in bark also have wide tubes in other parts, could to a certain extent be corroborated, the ratio being more constant for known crosses than for kampong trees. As for the first and most important point, the relation between tube bore and yield, it was found that a certain relation exists, but the correlation is worse, not better, than that between the number of latex rings and yields.

Trees with narrow tubes were found poor yielders, but trees with wide tubes were not necessarily good yielders. On the other hand, the best yielding trees have wide tubes, but the converse is not true; so prediction of future production exclusively on the basis of the diameter of the latex tubes is of dubious value.

Two reasons are given why trees with wide latex tubes may be poor yielders:

1. The anatomy of the bark does not satisfy theoretical requirements, as many tubes end blindly instead of running right through; the narrowest tubes may have a more decisive effect than the average diameter.

2. For known or as yet unknown physiological causes, the tree does not attain maximum yield (insufficient accumulation of latex in the system, unsatisfactory regeneration, absence of the dilution reaction on tapping, etc.). Here manuring may increase yield.

Finally, measuring the tube diameter is not of more value than counting latex rings. Both methods have the same defect: namely, that a well-developed tube system is not always accompanied by more than normal yield power; the latter, it is concluded, lies concealed in the finer physiology of the Hevea tree.

Java Blanket Crepe Suggested

In the *Indische Mercuur*, Ir. Spoon reminds rubber planters that with low prices and the necessity for economizing, production costs may be reduced by following a suggestion made by Prof. O. de Vries in 1923, that Java estates, like Ceylon and Malaya, should turn out blanket crepe. The following method is advocated by Dr. de Vries: After the latex has been collected and strained as usual, coagulate a portion in the most primitive manner in the form of sheets, the coagulum to be rolled out by light machines (if necessary not even printed), the sheets to be quickly dried in a well-ventilated place without smoking; then send the semi-finished product to some central and suitably located factory where it would be finished off as thick blankets. The sheets sent to the finishing factory need not be absolutely perfect as all slight imperfections disappear in the process of reworking. During 1923-24 some tests were conducted and a very satisfactory product resulted, but since the Batavia market showed little interest in it, tests ceased. Meanwhile, however, blanket crepe has become better known in Batavia, and attention again is drawn to its possibilities to effect saving in production costs.

The Local Market for Rubber Goods

Imports of rubber goods from the United States into the Netherlands East Indies for the first six months of 1929 were $956,375 against $1,108,692 for the entire year 1928. The main imports were automobile accessories, totaling $803,056 in the first half of 1929 and $792,458 for the year

1928. Figures for footwear for the same periods were, $8,355 and $15,188 respectively; for technical rubber goods, $78,207 against $110,603; waterproof materials, $43,534 against $70,787.

The automobile accessories from the United States included 53,224 automobile casings for Java and Madoera and 10,134 for the Outer Provinces. The Netherlands East Indies is one of America's best customers for bicycle and other tires, the annual imports valued at more than $120,000. America supplies 50 per cent of the Netherlands East Indies tire requirements. Then follows Germany with a much lower percentage; this country has now found in the Dutch East Indies one of its best markets for automobile accessories and succeeded in the beginning of 1929 in ousting Italy from second place as supplier of these goods. The fourth and fifth places are respectively held by Japan and France. The German share consists chiefly of tires for omnibuses from the Continental company of Hannover; while Italy's tires are supplied by Michelin and Pirelli.

Imports of American footwear are not important, but both Japan and Malaya find a ready market for their cheap products among the natives here. The imports of technical goods from America are steadily increasing, the shipments for the first six months of 1929 being 71 per cent of those for the whole of 1928. The most important items are hose and belting. Surgical and soft rubber goods from America show a marked decrease, the figures for 1929 being $20,843 against $118,591 in 1928. This decline is due to the keen competition from Germany and Austria, which supply much cheaper than America; but they are also becoming serious competitors in high grades of these goods. Germany's exports of surgical and soft rubber goods have in fact already exceeded the pre-war figure.

Malabar Co. to Sell Out

The directors of the Malabar Rubber Co., a Dutch firm, have decided to sell the enterprise. For low rubber prices have made it impossible to operate profitably, and the company's funds were so depleted that bankers refused to extend facilities.

MALAYA

No May Tapping

The tapping holiday in May proposed by the Rubber Growers' Association and the Dutch committee is being strongly supported by the local planters' associations, both European and Asiatic. However, there is little enthusiasm, adherence being given to the scheme more as a duty than anything else. The attitude of the average concern is reflected in the statement made by the chairman of the Sungei Ramal Syndicate, Ltd.

Said he, "As regards general restriction of crop, I personally favor no interference with production in the way of arbitrary crop restriction. There are so many complications of a serious nature to be dealt with, that it seems to me any scheme is just as likely to make things worse eventually as to make them better. However, to encourage cooperation, we propose to support the Rubber Growers' Association recommendation for stoppage of tapping in May, and trust its final effects will be better than we expect."

The *Straits Times* has this to say: "We cannot imagine any sound economist regarding the tapping holiday plan with enthusiasm. Overhead charges, including all salaries, will have to be met for a month in which there will be absolutely no return as against an existing return which still shows an actual profit to the majority of producers. The rise in price will need to be substantial if the leeway is to be made up, and if that substantial rise does take place, there will be a general rush to speed up production to the utmost in order to make the most of the boomlet. We shall then find ourselves once more with nervous buyers and an overstocked market. If the rise is only slight, presumably producers will be asked to agree to further periods of curtailment. There is room for considerable doubt as to how many of them would risk the second experiment if the first brought disappointment."

Estate Costs and Production

The Ayer Molek Rubber Co., Ltd., a Chinese concern, owns an estate of 1,411 acres of which 997 acres are planted and 616 acres are bearing. The comparative results for the last two years are:

	1927-28	1928-29
Area Bearing	616 acres	616 acres
Number of Mature Trees	56,446	53,200
Area Tapped	296 acres	321 acres
Number of Trees in Tapping	32,932	35,518
Average Number of Trees Tapped Per Day	28,290	28,701
Total Output in Pounds	167,336	190,854
Average Yield Per Tree Tapped Per Annum, in Pounds.	5.91	6.60
Gross Selling Price Per Pound	Cents 31.03	Cents 32.03
All-in Cost Per Pound	26.49	25.46
Net Profit Per Pound on Rubber	4.54	6.57
The all-in costs were made up as follows:		
Tapping and Manufacturing	Cents 12.65	Cents 11.45
General Expense	12.98	11.82
Packing, Transport of Crops, Handling, and Selling Charges	.52	.92
Rubber Assessment	....	.81
Directors' Fees	.34	.46

The company booked a profit of $17,376 for 1928-29 and turned out a dividend of 6 per cent.

Acquisition of Estates

The Klabang Rubber Co. reports the purchase of the Karai estate which was taken over as from January 1, 1930. The estate has an area of 516 acres of mature rubber and was sold for 25,000 shares of £1 each fully paid.

The Chersonese (Federated Malay States) Estates has purchased the Nellmay Estate for 300,000 shares of 2 shillings each fully paid and £10,000 in cash. The newly acquired estate is an adjoining property and was also taken over as from January 1, 1930. It covers an area of 1,111 acres of which 501 acres are planted with rubber and 579 acres with coconuts.

CEYLON

When prices for rubber are low, as at present, the market is always more critical in regard to the finish of sheets and crepe, and slight defects are now considered sufficient cause for rejection. As streakiness or uneven coloring of blanket crepe is a common defect, T. E. H. O'Brien, chemist, Rubber Research Scheme, Ceylon, writes on the causes of this defect in the *Tropical Agriculturist*. Discolorations or variations in color, which may be hardly perceptible in lace crepe, become quite noticeable in thick blanket crepe.

Among the causes of streakiness mentioned is surface mold, which frequently develops on the lace crepe in wet weather. Trouble with surface mold on crepe appears to be increasing in Ceylon factories, and it is considered a matter of gradual infection. Drying sheds which have been free from mold may become infected and the trouble will increase progressively. In case of surface mold, the latex should be treated with paranitrophenolin, the proportion of 1 to 4,000 parts of latex. However, precautions should be taken against exposing crepe so treated to direct light as this causes the material to become discolored. Further, the temperature in the drying rooms should be raised, and, as mold infection is considered to be centered mainly on the floor and on the reapers, floor boards and reapers should be treated with Atlas A wood preservative and should also be washed with a 2 per cent solution of formalin.

Sunlight and direct window light cause discoloration; therefore shades should be fitted to the windows. That iron in the water used for diluting and coagulating latex would discolor crepe, is not confirmed. Rapid darkening of crepe has been ascribed to iron in the water but it may be due to adulteration of the latex by coolies. Where discoloration cannot be traced to other causes, there is a possibility of latex adulteration.

JAPAN

The Japanese appear to be taking advantage of the present situation to increase rubber acreages. It is learned that the well-known Mitsubushi concern has acquired 30,000 acres on the East Coast of Sumatra for growing rubber. A company known as the Higashiyama Plantation Co., with capital of 4,000,000 guilders, has been formed for this purpose. The Japanese Ohuna concern has acquired 50,000 acres in Sumatra and Malaya and will plant rubber and coconuts.

Rubber Patents, Trade Marks and Designs

Machinery

United States

1,748,243.* SHEET FEEDER AND CUTTER. This machine automatically advances an accurate length of sheeted material, severs it to form a blank, which is advanced to the next manufacturing operation. J. A. Peterson, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,748,626.* MOLDING FAN BELTS. This invention relates to a means for mounting endless fan belts in molds and stretching them so that they are vulcanized under tension. H. E. Waner, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,749,882.* TRIMMING MACHINE. This apparatus trims overflow from molded rubber articles such as heels. P. R. Hoopes, Hartford, Conn., assignor to Essex Rubber Co., Trenton, N. J.

1,750,424.* MOLDING MACHINE. This molds battery boxes by hydraulic power, the mold having a removable sidewall automatically locked against movement during the molding operation. N. L. Olson, Highland Park, Mich., assignor to American Hard Rubber Products Corp., a corporation of Mich.

1,750,437.* TIRE LINING MACHINE. This facilitates application of non-adhesive material to the inner circumferential surface of flat-built tires. W. C. State, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,750,470.* MOLD CLEANER. This removes hard sulphur deposit from mold plates by means of an adjustable rotating wire brush, which may be moved longitudinally, laterally, and vertically with relation to the mold surfaces being cleaned. H. J. Hoenes, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,750,613.* VULCANIZATION APPARATUS. This device distends pneumatic tire casings in a curing mold by means of sand compacted into the casing by air pressure, thus displacing airbags or cores. H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

* Pictured in group illustration.

1,750,708.* HEEL DIEING-OUT MACHINE. This device dies out heel blanks from sheets of rubber as they come from the calender. A set of revolving dies forms a rolling contact with the rubber sheet and cuts the blanks, which are removed while the surplus rubber is returned to the calender. A. J. Edwards, Cambridge, assignor of one-half to G. N. Goddard, Newton, both in Mass.; P. E. Edwards, administrator of A. J. Edwards, deceased.

1,751,116.* CALENDER. This is provided with overhanging rolls journaled at one side only to permit changing of rolls for calendering stock of different forms. Novel provision is made for steam and water circulation. P. E. Welton, Cuyahoga Falls, O.

1,751,451.* BLANK CUTTER. This machine severs a continuously moving sheet into blanks of different lengths for producing inner tubes and conveys them to operators stationed along an endless traveling conveyer. A. G. Smith, assignor to Miller Rubber Co., both of Akron, O.

17,618 (Reissue). TIRE CASING DEVICE. E. Hopkinson, New York, N. Y.

1,748,263. TIRE BUILDER. G. F. Wikle, Milwaukee, Wis.

1,748,264. BEAD WRAPPER. G. F. Wikle, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

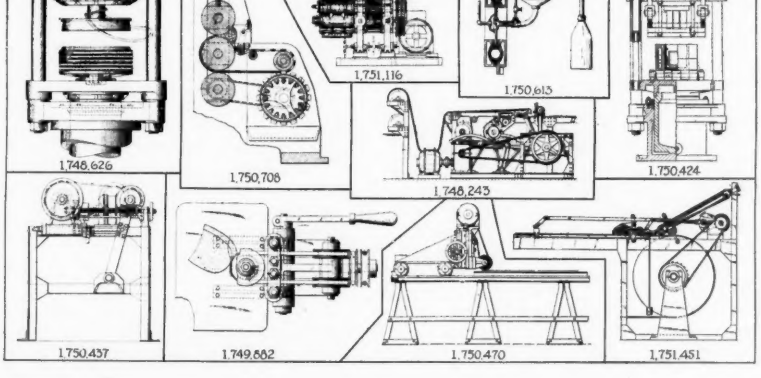
1,748,265. BUILDING CORE. G. F. Wikle, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,748,266. WEB CUTTER. G. F. Wikle, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,748,299. TIRE BUILDER. C. E. Maynard, Northampton, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,748,300. MARKER. C. E. Maynard. Northampton, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,748,583. INNER TUBE CONVEYER. M. H. Pade, assignor to Firestone Tire & Rubber Co., both of Akron, O.



1,748,590. TIRE RETREADER. R. D. Vincent, Barberton, assignor to Firestone Tire & Rubber Co., Akron, both in O.

1,748,591. MOLD ENGRAVER. C. Uschmann, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,748,622. TIRE-MAKING MACHINE. M. C. Scrote, Kenmore, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,748,977. LASTING JACK. H. G. Ellis, Waltham, assignor, by mesne assignments, to Hood Rubber Co., Inc., Watertown, both in Mass.

1,749,013. AIRBAG. W. S. Wolfe, Akron, and J. R. Crossan, Wadsworth, both in O., assignors to Seiberling Rubber Co., a corporation of Del.

1,749,297. BELT TESTER. C. A. Norman, Columbus, O.

1,749,420. COLLAPSIBLE CORE. H. A. Denmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,749,886. TIRE-BUILDING FORM. J. E. Palmer, assignor to Summit Mold & Machine Co., both of Akron, O.

1,749,921. COATING APPARATUS. A. B. Mullin, Kenmore, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,749,922. TIRE-BUILDING FORM. J. E. Palmer, assignor to Summit Mold & Machine Co., both of Akron, O.

1,749,991. TESTER. F. A. Valentine, Apponaug, and D. C. Scott, Providence, assignors to Henry L. Scott Co., Providence, all in R. I.

1,750,169. LASTING JACK. J. H. Flink, Watertown, Mass., assignor, by mesne assignments, to Hood Rubber Co., Inc., Wilmington, Del.

1,750,263. VULCANIZING PRESS. J. R. Gammeter, Akron, O.

1,750,464. VULCANIZER. H. C. Bostwick, Kenmore, A. J. Fleiter, and T. A. Miller, assignors to Akron Standard Mold Co., all of Akron, all in O.

1,750,753. DRIER. E. Hopkinson, assignor to General Rubber Co., both of New York, N. Y.

1,750,813. DRIER. A. T. Oakley, Thompson, O., and P. Lupke, Jr., assignors to Essex Rubber Co., both of Trenton, N. J.

1,750,867. ADJUSTABLE TIRE RETREADING MOLD. F. L. Smith, J. S. Caufield, and C. J. Peterson, all of Sacramento, Calif., assignors, by mesne assignments, to Super Mold Corp., Reno, Nev.

1,751,392. TIRE COVER VULCANIZER. A. E. Burch, Melbourne, Victoria, Australia.

Dominion of Canada

297,703. RETREAD VULCANIZER. A. V. E. Grönberg, Malmö, Sweden.

298,030. TIRE VULCANIZING MOLD. Goodyear Tire & Rubber Co., assignee of P. Keller, both of Akron, O., U. S. A.

298,127. TIRE SHAPING DEVICE. E. Hopkinson, New York, N. Y., U. S. A.

298,176. BEAD TAPE WEAVER. American Chain Co., New York, N. Y., assignee of National-Standard Co., assignee of R. C. Pierce, both of Niles, Mich., all in the U. S. A.

298,212. PLY STRETCHER. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. S. Thompson, Detroit, Mich., U. S. A.

298,213. TIRE MAKING MACHINE. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.

298,214. TIRE MAKING MACHINE. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of G. K. McNeill, Detroit, Mich., U. S. A.

298,217. MOLDING APPARATUS. Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of H. Willshaw, H. Smith, and F. G. Broadbent, all of Birmingham, all in England.

298,307. SHEATHED ARTICLE APPARATUS. Western Electric Co., Inc., New York, N. Y., assignee of R. C. Kivley, Oak Park, Ill., both in the U. S. A.

298,308. CONTINUOUS CORE COVERER. Western Electric Co., Inc., New York, N. Y., assignee of R. C. Kivley, Oak Park, Ill., both in the U. S. A.

298,430. ROLL CALIPER. Farrel-Birmingham Co., Inc., Ansonia, assignee of C. F. Schnuck, New Haven, both in Conn., U. S. A.

298,586. VULCANIZING SOLES TO UPPERS. F. Nielsen, Epping, N. S. W., Australia.

United Kingdom

323,178. VIBRATION ABSORBER. H. C. Lord, Erie, Pa., U. S. A.

323,310. VULCANIZING MOLD. Dunlop Rubber Co., Ltd., London, H. Willshaw and T. Norcross, both of Birmingham.

323,382. VULCANIZER. Dunlop Rubber Co., Ltd., London, and T. Norcross, Birmingham.

323,798. TIRE VULCANIZING MOLD. L. L. J. Poblin, London.

324,203. VULCANIZER. Dunlop Rubber Co., Ltd., London, H. Willshaw and W. G. Gorham, both of Birmingham.

Germany

493,438. TUBE INFLATER. R. Bruck, Werlau b. Sanct Goar.

493,620. TUBING APPARATUS. Anode Rubber Co., Ltd., Guernsey, England. Represented by W. Karsten and C. Wiegand, both of Berlin, S. W. 11.

493,709. HYDRAULIC PRESS. J. S. Fries Sohn, Frankfurt a. M.

493,722. SPONGE RUBBER TESTER. Continental Gummi-Werke A. G., Hannover.

494,621. HEEL MOLD. H. Kasthonig, Essen.

494,662. TIRE REPAIR MOLD. A. V. E. Grönberg, Malmö, Sweden. Represented by F. Spielmann, Leipzig.

Designs

1,108,093. VULCANIZING AND MOLDING MACHINE. Dunlop Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, H. Weil, all of Frankfurt a. M., and T. R. Koehnhorn and E. Noll, both of Berlin S. W. 11.

1,108,096. VULCANIZING BANDS. Berliner Maschinen-Treibriemen Fabrik Adolph Schwartz & Co., Berlin N. 65.

1,108,150. HEEL AND SOLE MOLD. A Wagener, Berlin-Charlottenburg.

1,109,295. SOLE MOLD. W. Barsikow, Dresden-A.

1,109,296. HEEL MOLD. W. Barsikow, Dresden-A.

1,110,078. TIRE GAGE. A. Schirmacher, Berlin-Charlottenburg.

1,110,190. SHOE VULCANIZER. Schuhmaschinenfabrik Fulda, G. m. b. H., Fulda.

Process

United States

1,749,824. BONDING RUBBER. H. C. Lord, Erie, Pa.

1,749,899. TIRE BEAD REENFORCEMENT. S. W. Alderfer, Akron, O., assignor to National-Standard Co., Niles, Mich.

1,750,177. PURE RUBBER FROM LATEX. P. Klein, Budapest, Hungary, assignor, by mesne assignments, to American Anode, Inc., a corporation of Del.

Dominion of Canada

298,247. PRINTING PLATES. Lanson Paragon Supply Co., Ltd., assignee of R. D. Bain and J. Nelson, all of London, E. C. 2, England.

298,648. CUSHION TIRE. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of J. M. Hibner, Detroit, Mich., U. S. A.

298,663. BOOTS. Hood Rubber Co., Inc., assignee of Hood Rubber Co., assignee of A. A. Glidden and T. M. Knowland, all of Watertown, and H. L. Davis, Walpole, all in Mass., U. S. A.

United Kingdom

323,235. FLUID CONTAINER. India Rubber, Gutta Percha & Telegraph Works Co., Ltd., and W. L. Avery, of India Rubber, Gutta Percha & Telegraph Works, Silvertown, both in London.

324,211. ORNAMENTING COATED FABRICS. J. Mandleberg & Co., Ltd., and J. Lloyd, both of Manchester.

Chemical

United States

1,749,008. INSULATING MATERIAL. H. G. Walker, La Grange, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,749,607. DISPERSING RECLAIM. R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in N. Y., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,749,608. DISPERSING RUBBER. R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in N. Y., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,749,743. TREATING LINERS. L. B. Sebrell, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,750,087. PAINT, VARNISH, AND ENAMEL. W. F. Bleecker and E. A. Clark, both of Boulder, Colo.

1,750,460. COMPOSITION. C. M. Carson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,750,540. RUBBER MANUFACTURE. U. Pestalozza, assignor to Società Italiana Pirelli, both of Milan, Italy.

1,750,583. COMPOSITION. C. Ellis, Montclair, N. J., assignor to Chadeloid Chemical Co., New York, N. Y.

1,750,619. DENTURE. C. E. Bradley, Mishawaka, Ind.

1,750,767. AQUEOUS RUBBER DISPERSIONS. M. C. Teague, Jackson Heights, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

Dominion of Canada

297,763. ELECTRODEPOSITION OF RUBBER. Anode Rubber Co., Ltd., Guernsey, assignee of P. Klein, Budapest VII, Hungary.

297,764. RUBBER DISPERSIONS. Anode Rubber Co., Ltd., Guernsey, assignee of P. Klein, Budapest VII, Hungary, and A. Szegvari, Akron, O., U. S. A.

298,000. SEALING COMPOSITION. Dewey & Almy Chemical Co., N. Cambridge, assignee of C. H. Egan, Boston, and W. I. McGowan, Cambridge, all in Mass., U. S. A.

298,027. ANTIOXIDANT. Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

298,031 and 298,032. RUBBER CONVERSION PRODUCT. Goodyear Tire & Rubber Co., Akron, O., assignee of H. A. Bruson, Philadelphia, Pa., both in the U. S. A.

298,091. VULCANIZABLE RUBBER MASS. E. Kleiber, Lugano, Switzerland.

298,114. CHLORINATED COMPOSITION. F. C. Dyche-Teague, London, W. 2, England.

298,215. COMPOSITION. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of J. H. Reed, Jackson Heights, N. Y., and H. E. Cude, Manchester, Conn., both in the U. S. A.

298,690. TREATING LATEX. Pirelli, Ltd., London, England, assignee of U. Pestalozza, Milan, Italy.

298,698 and 298,699. ACCELERATORS. Rubber Service Laboratories Co., assignee of W. Scott, both of Akron, O., U. S. A.

United Kingdom

323,321. COMPOSITION. T. Hashimoto, Tokio, Japan.

323,322. COMPOSITION. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

323,512. ACCELERATORS. I. G. Farbenindustrie A. G., Frankfort-on-Main, and W. Kropp, Elberfeld, both in Germany.

323,519. TREATING LATEX. Dunlop Rubber Co., Ltd., London, G. W. Trobridge, and E. A. Murphy, both of Birmingham.

323,526. UTILIZING WASTE RUBBER. H. E. Potts, Liverpool. (H. Plauson, Hamburg, Germany.)

323,579. MILDEW PROOFING RUBBER. British Cotton Industry Research Assn., and R. G. Fargher, both in Didsbury; L. D. Galloway and M. E. Probert, both in Cheadle, Cheshire.

323,580. COMPOSITION. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

323,721. SYNTHETIC RUBBER. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

323,755. COLORING RUBBER. Dunlop Rubber Co., Ltd., London, E. A. Murphy and A. Niven, both of Birmingham.

324,004. SYNTHETIC RUBBER. J. Y. Johnson, and A. Carpmael, both of London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

324,006. COLORING RUBBER. Dunlop Rubber Co., Ltd., London, and G. W. Trobridge, Birmingham.

324,104. TREATING LATEX. Dunlop Rubber Co., Ltd., London, D. F. Twiss, F. T. Purkis, and E. A. Murphy, all of Birmingham.

324,186. RUBBER THREAD. F. C. Jones, London.

324,287. VULCANIZING LATEX. Dewey & Almy Chemical Co., and D. M. Stevens, both of Cambridge, Mass., U. S. A.

General

United States

1,748,074. INSULATED STEERING ARM. F. L. Lipcot, New York, N. Y., assignor to Rubber Shock Insulator Corp., Wilmington, Del.

1,748,079. LAMINATED GLASS. J. W. H. Randall, New York, N. Y., assignor to Libbey-Owens Glass Co., Toledo, O.

1,748,100. COATED PULLEY. E. S. Avery, E. Hampton, N. Y.

1,748,170. CHILDREN'S BUOYANT SEAT. J. Chesnut, Clearwater, Fla.

1,748,377. SHOE SHANK CUSHION. W. J. Anding, Columbus, O.

1,748,406. SPONGE SOAP RETAINER. G. W. Blair, Chicago, Ill.

1,748,487. MOUNTING FOR GLASS FLOORS. A. F. Masury, New York, N. Y., assignor, by mesne assignments, to Rubber Shock Insulator Corp., Bridgeport, Conn.

1,748,636. ARTIFICIAL FLOWER. J. B. Crockett, assignor to Cambridge Rubber Co., both of Cambridge, Mass.

1,748,650. IGNITION DISTRIBUTOR COVER. O. D. Hollenbeck, Wadsworth, assignor to Seiberling Latex Products Co., Barberton, both in O.

1,748,731. NIPPLE. H. A. Reisman, New York, N. Y.

1,748,824. RUBBER-CHAIN HOOK ATTACHMENT. C. A. Barden, Oberlin, O.

1,749,032. SLEEVE FORM. W. A. Finkel, Washington, D. C.

1,749,046. POWER-TRANSMISSION BELT. E. W. Snyder, assignor to L. H. Gilmer Co., both of Philadelphia, Pa.

1,749,322. UNIVERSAL JOINT. W. A. Chryst, assignor, by mesne assignments, to Delco Products Corp., both of Dayton, O.

1,749,335. CANTILEVER-SPRING SHACKLE. H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,749,474. BALLOON ENVELOPE. J. D. Edwards, Oakmont, assignor to Aluminum Co. of America, Pittsburgh, both in Pa.

1,749,573. DOORCHECK. A. C. Earhart, Cleveland Heights, O.

1,749,631. BRAKE LINING. R. J. Evans, Huntington, Ind.

1,749,659. PACKING. G. W. Beldam and J. Smith, Ealing, assignors to Beldam Packing & Rubber Co., Ltd., London, both in England.

1,749,711. RAFT. H. Meyer, Berlin, Germany.

1,749,753. LAMP CHANGER. C. C. Caulfield, Niles, O.

1,749,766. TIRE. J. C. Hitchner, assignor to Hitchner Tire Corp., both of Philadelphia, Pa.

1,749,820. BUOYANT BATHING DEVICE. H. A. Johnson, Northfield, Mass.

1,750,004. RUBBER-STAMP ASSEMBLY. H. H. Hellesoe, Chicago, Ill.

1,750,165. OVERSHOE. E. W. Dunbar, Hudson, assignor to Cambridge Rubber Co., Cambridge, both in Mass.

1,750,179. OVERSHOE. W. MacPherson, Cambridge, and E. W. Dunbar, Hudson, assignors to Cambridge Rubber Co., Cambridge, all in Mass.

1,750,302. MOLDED COMPOSITION ARTICLE. H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,750,333. MOP-HANDLE GUARD. F. Schweigert, New York, N. Y.

1,750,346. SPRING SHACKLE. R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,750,509. TIRE-DEFLATION SIGNAL. A. S. Craig, Kansas City, Mo.

1,750,607. SPRING SHACKLE. C. R. Short, Dayton, O., assignor to General Motors Research Corp., Detroit, Mich.

1,750,644. TENNIS RACKET HANDLE. H. W. Norton, assignor to Dayton Steel Racquet Co., both of Dayton, O.

1,750,799. SHOE. A. A. Glidden, assignor, by mesne assignments, to Hood Rubber Co., Inc., both of Watertown, Mass.

1,751,109. PAVEMENT. R. H. Smith, Brookfield, Mass.

1,751,275. PLAYBALL. J. R. Gammeter, Akron, O., assignor to A. G. Spalding & Bros., New York, N. Y.

Dominion of Canada

297,888. SHOE. A. P. Beal, Lindsay, Ont.

297,911. PAVING BLOCK. L. Gaisman, Audenshaw, England.

297,960. ELASTIC SHAFT COUPLING. L. Thiry, Huy, Belgium.

298,023 and 298,024. AIRBAG VALVE. Goodyear Tire & Rubber Co., assignee of C. van Rennes, both of Akron, O., U. S. A.

298,025. TIRE PATCH. Goodyear Tire & Rubber Co., Akron, O., assignee of D. S. Harrington, Atlanta, Ga., both in the U. S. A.

298,028. AIRBAG CONNECTION. Goodyear Tire & Rubber Co., assignee of R. C. Bateman, both of Akron, O., U. S. A.

298,029. VEHICLE SPRING CONNECTION. Goodyear Tire & Rubber Co., assignee of J. D. Berwick, both of Akron, O., U. S. A.

298,033. TIRE VALVE SEALING DEVICE. Goodyear Tire & Rubber Co., assignee of G. E. Disney, both of Akron, O., U. S. A.

298,099 and 298,100. PAVEMENT MARKER. M. E. Hartzler, Downers Grove, and E. P. Romilly, Chicago, co-inventors, both in Ill., U. S. A.

298,244. BUDDING AND GRAFTING TAPE. Johnson & Johnson, Ltd., Montreal, P. Q., assignee of P. B. L'Hommedieu, New Brunswick, N. J., U. S. A.

298,522. AIR VALVE. J. McDivitt and F. H. Deagan, assignees of J. S. Cutherbertson, all of Buffalo, N. Y., U. S. A.

298,660 and 298,661. OVERSHOE UPPER. Hood Rubber Co., Inc., assignee of Hood Rubber Co., assignee of A. A. Glidden, all of Watertown, and W. R. Hickler, Weston, all in Mass., U. S. A.

298,662. FABRIC AND RUBBER ARTICLE. Hood Rubber Co., Inc., assignee of Hood Rubber Co., assignee of A. A. Glidden, all of Watertown, and W. R. Hickler, Weston, all in Mass., U. S. A.

United Kingdom

323,263. TUBE. A. C. Lawrence, Hertfordshire.

323,394. TIRE PROTECTIVE LINER. R. Schäfer, Berlin, A. Meier, Munich, and A. Meier, Berlin, all in Germany.

323,399. ROD FOR STIRRING CHEMICALS. New Eccles Rubber Works, Ltd., Lancashire, and C. Hemm, Cheshire.

323,462. CYCLE MUDGUARD END FLAPS. Dunlop Rubber Co., Ltd., London, and F. R. Carr, Birmingham.

323,468. AUTOMOBILE STEP PLATE. O. C. R. Woller, Chicago, Ill., U. S. A.

323,588. CATAMENIAL APPLIANCE. R. B. Lyness, Glasgow, Scotland.

323,659. PUNCH BALL. Rheinische Gummi- Und Celluloid-Fabrik, Mannheim, Germany.

323,707. CYCLE SADDLE. J. F. McPhie, Glasgow, Scotland.

323,762. MILKING MACHINE TEAT CUP. R. C. Pessell, Bath, and Petters, Ltd., Yeovil.

323,876. COAT SLEEVES. I. Abrahams and Express Rubber Co., Ltd., both of London.

323,897. GOLF CLUB. Dunlop Rubber Co., Ltd., C. F. Griffin, and J. D. McDonald, all of London, and J. T. T. Randles, Birmingham.

323,935. EDGES FOR GAITERS. R. D. Cond and W. T. Smith, trading as Grosvenor Rubber Co., both of Birmingham.

323,945. DETACHABLE HEEL PROTECTOR. Westland Gummiwerke Ges., Westphalia, Germany.

323,965. TIRE DEFLATION INDICATOR. R. Münnich, Dresden, Germany.

323,993. BRUSH. M. Samuel, Mecklenberg, Germany.

324,003. SPRINGS. L. Turner & Co., Ltd., G. L. Brooke-Hunt, and L. Rowland, all of Leicester.

324,076. TOYS. L. and I. Dorogi, and Dr. Dorogi Es Tarsa Gummigyar R. T., all of Budapest, Hungary.

324,098. BOOT. D. W. Mortlock and F. Niblock, both of Singapore, Strait Settlements.

324,113. BATHING CAP FASTENINGS. Reliance Rubberware, Ltd., London. (T. W. Miller, Ashland, O., U. S. A.)

324,152. CONDENSER MICROPHONE. P. G. A. H. Voigt, London.

324,164. TOY. A. Weinstein, Hamburg, Germany.

324,194. NIPPLE. B. Woolf, Birmingham.

324,218. BALL. F. Ruegenberg, Olpe, Germany.

324,237. TEETH CLEANER AND MASSAGER. R. D. Bell, Coogee, Australia.

324,278. VEHICLE FLEXIBLE CONNECTION. A. E. White, London. (T. I. Duffy, Detroit, Mich., and J. C. Walker, Chicago, Ill., both in the U. S. A.)

Germany

493,304. BEARING. Continental Gummi-Werke, A. G., Hannover.

493,837. INNER TUBE. W. Dahm, Trier a. d. Mosel.

493,971. SOLE AND HEEL. P. H. Letchford, Winnipeg, Man., Canada. Represented by B. Kugelmann, Berlin S. W. 11.

494,537. BELT. W. Liedloff, Bremen.

494,663. ANTI-SKID CHAIN. D. M. Weigel, New York, N. Y., U. S. A. Represented by H. Barschall, Berlin W. 8.

494,669. CONTAINER FOR HEELS. H. Quitsch, Kintel b. Hade, Oldenbg.

Designs

1,107,368. CHEST EXPANDER. W. Kampschulte A. G., Solingen.

1,107,382. FOLDING BOAT. Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.

1,107,465. BALL COVER. Continental Gummi-Werke A. G., Hannover.

1,107,524. CONCRETE JOINT FILLER. Franz Clouth Rheinische Gummiwarenfabrik A. G., Koln-Nippes.

1,107,674. BELT. Gompara A. G., Krefeld.

1,108,046. STAMP. H. Hurwitz Nachf. Inh. Herbert Striegler, Leipzig C. 1.

1,108,517. HORSESHOE. L. Chanoux and L. Albisson, both of Orange, France. Represented by E. Lamberts, Berlin S. W. 61.

1,108,553. BALL CLOSURE. Rheinische Gummi-Gesellschaft W. Klotz & Co., Dusseldorf.

1,108,580. HAIRDRESSER'S COLLAR. H. Thony, Hamburg.

1,108,740. FOOTWEAR. Albert Levy & Co., Frankfurt a. M.

1,108,834. PNEUMATIC TIRE. K. Pattberg, K. Zeh, and F. Schweizer, all of Hof a. d. S.

1,108,937. PERFORATED MATS. F. Bauer, Berlin N. W. 6.

1,109,150. BATHING SHOE. Belinde G. m. b. H., Berlin S. W. 68.

Trade Marks

United States

267,648. SHEEP-O-LEATH. Raincoats. A. Shaub, doing business as Shaub Raincoat House, New York, N. Y.

267,651. Representation of an elephant and the word: "ELEPHANT." Raincoats. Cooper Rain Wear Mfg. Co., New York, N. Y.

267,702. PATRICIAN. Fountain pens and pencils. L. E. Waterman Co., New York, N. Y.

267,706. Circle containing representation of a duck and the word: "RAINCO." Raincoats. Cumberland Raincoat Co., Jellico, Tenn.

267,726. Outline of an airplane. Golf balls. Des Rosiers Patents Co., Inc., Providence, R. I.

267,751. Representation of a badger on a tire. Cements. Badger Rubber Works, Milwaukee and Cudahy, Wis.

267,752. BADGER. Cements. Badger Rubber Works, Milwaukee and Cudahy, Wis.

267,828. PARA-HYTEX. Shower curtains. Para Rubber Co., Newark, N. J.

267,838. PETROBENZOL. Petroleum by-product cut to specifications to replace benzol in lacquer and rubber industries. Anderson-Prichard Oil Corp., Oklahoma City, Okla.

267,862. STATE LINE. Inner tubes. J. Edelson, doing business as J. E. Auto Supply Co., Chicago, Ill.

267,905. DR. TRAUN'S DICHTUNGSGUMMI "IDEAL." Rubber in sheet form. Dr. H. Traun & Söhne, vormals Harburger Gummi-Kamm-Co., Hamburg, Germany.

267,925. PARA-MORAYTONE. Rubberized textiles for domestic and household purposes. Para Rubber Co., Newark, N. J.

267,926. PARA-HYTEX. Rubberized textiles for domestic and household purposes. Para Rubber Co., Newark, N. J.

267,930. VIKING. Bathing shoes. I. B. Kleinert Rubber Co., New York, N. Y.

267,934. VARSITY. Heels, soles, and half-soles. Hanover Rubber Co., W. Hanover, Mass.

267,969. FEDERAL. Tire-repair plugs. Federal Rubber Co., Chicago, Ill., Cudahy, Wis., and Chicopee Falls, Mass.

268,033. WERON. Heels and soles. Webster Rubber Co., Sabattus, Me.

268,042. ELFANTIDE. Rubberized fabrics. Haartz-Mason Rubber Mfg. Co., Watertown, Mass.

268,043. FLOR-A-DORA. Floor mats. Eno Rubber Corp., Los Angeles, Calif.

268,044. PIX-M-EZ. Coin mats. Eno Rubber Corp., Los Angeles, Calif.

268,089. PASTEL. Toothbrushes. Rubber & Celluloid Products Co., Newark, N. J.

268,122. Representation of a badger on a tire. Patches, repair kits, and belts. Badger Rubber Works, Milwaukee and Cudahy, Wis.

268,123 and 268,126. BADGER. Tire flaps, flap material, disks, tires, tubes, and tire covers. Badger Rubber Works, Milwaukee and Cudahy, Wis.

268,124. Representation of a badger. Tires and inner tubes. Badger Rubber Works, Milwaukee and Cudahy, Wis.

268,193. DELAWEAR. Soles and heels. Essex Rubber Co., Inc., Trenton, N. J.

268,205. MODERNIST. Soles and heels. Hood Rubber Co., Inc., Watertown, Mass.

268,254. Red line and the words: "RED LINE." Adhesives. Goodyear Tire & Rubber Co., Akron, O.

268,429. NASSAU. Fire hose. Hewitt-Gutta Percha Rubber Corp., Buffalo, N. Y.

268,541. SPDX. Accelerator. C. P. Hall, doing business as C. P. Hall Co., Akron, O.

268,569. Design containing the letter: "J," and above the word: "JAX." Cement. Holtite Mfg. Co., Baltimore, Md.

268,570. Circle containing representation of a fist clutching a bar, and above, the word: "HOLTITE." Cement. Holtite Mfg. Co., Baltimore, Md.

268,571. Diamond containing the letter: "C," and above, the word: "COMMANDER." Cement. Holtite Mfg. Co., Baltimore, Md.

268,743. EXCELSIOR. Surgical appliances. Hanover Rubber Co., "Excelsior," Inc., New York, N. Y.

268,775. Circle containing the symbol: "NE." Vulcanizer heaters and doors therefor. National-Erie Co., Erie, Pa.

268,827. WEARTEX. Belts. Victor Balata & Textile Belting Co., New York, N. Y.

268,828. CARRYTEX. Belts. Victor Balata & Textile Belting Co., New York, N. Y.

268,885. ONEIDA. Shoes. United States Rubber Co., New Brunswick, N. J.

268,909. COOPER. Storage batteries. Cooper Corp., Cincinnati, O.

268,936. CUSTOM BILT. Tires. Swinehart Tire & Rubber Co., Akron, O.

Dominion of Canada

48,599. AIRWHEEL. Tires, tubes, and accessories therefor. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

48,632. Circle containing representation of two eagles. Tires. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

48,636. Representation of a sidewall of a tire having a fancy design thereon. Tires. India Tire & Rubber Co., Akron, O., U. S. A.

48,638. Design consisting primarily of representation of two eagles in a circle, two stripes, and a tire casing. Tires. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

48,656. DOUGHNUT. Tires, tubes, and accessories therefor. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

48,671. WINGFOOT. Storage batteries. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

48,711. Circle containing the letters: "B R" and the words: "FINE TOOLS." Rubber machinery. Black Rock Mfg. Co., Bridgeport, Conn., U. S. A.

48,826. Words: "SAMARITAN SHOE" and "KIND TO YOUR FEET." Footwear. P. C. Wolfer, Everett, Mass., U. S. A.

48,866. GRISTLE. Soles and heels. Avon Sole Co., Avon, Mass., U. S. A.

United Kingdom

505,685. Representation of the globe upon which appear the letters and the word: "U G S A RUBBERSKIN." Heels and soles. Manufacture Generale de Caoutchouc Usines Gheysen, Société Anonyme, Brussels, Belgium.

506,347. TRANSLUX. Tires. Société en Commandite par Actions O. Englebert Fils & Cie, Liege, Belgium.

507,343. PHARMENA. All goods in Class 40. Leyland & Birmingham Rubber Co., Ltd., Leyland, Lancashire.

508,332. JATEX. Latex. Jeavons, Tinto & Co., Ltd., London, E.C.3.

509,669. OTTER. Goods not included in classes other than Class 40. Beldam Packing & Rubber Co., Ltd., London, E.C.3.

509,671. PANTHER. Goods not included in classes other than Class 40 and excluding footwear products also. Beldam Packing & Rubber Co., Ltd., London, E.C.3.

509,685. KING COTTON. Tires and inner tubes. Naamlooze Vennootschapp Vereenigde Nederlandsche Rubberfabriken, Doorwerth, Heveadorp, Holland.

509,696. "MARKSMAN." All goods in Class 11. Dunlop Rubber Co., Ltd., London, N.W.1.

509,735. KITTORIET. Steam and hydraulic packing and jointing. Naamlooze Vennootschap Rubberproducten Mij, Amsterdam, Holland.

509,821. "CANOVE." India rubber sponge substitutes. Canove Société Anonyme de Nouveautés en Caoutchouc, Paris, France.

509,843. CRUISER. All goods in Class 40. Dunlop Rubber Co., Ltd., London, N.W.1.

Designs

United States

80,740. GOLF BALL. Term 14 years. W. J. Perry, assignor to India Rubber, Gutta Percha & Telegraph Works Co., Ltd., both of London, England.

Dominion of Canada

8,621. BATHING CAPS. Dominion Rubber Co., Ltd., Montreal, P. Q.

8,622 and 8,623. RUBBER COMPOSITION SHEET MATERIAL FOR FOOTWEAR. Dominion Rubber Co., Ltd., Montreal, P. Q.

8,649. TIRE TREAD. Gutta Percha & Rubber, Ltd., Toronto, Ont.

MARKET REVIEWS

CRUDE RUBBER

New York Exchange

IN our review for last month we stated that "the topic of greatest interest to the rubber trade at this time is the success or the failure of the attempts to curtail production in the Far East." We also said that "assuming but 85 per cent of the area will come into the scheme, the decrease in the world's output if the plan be adopted would be 30,000 tons for 1930."

Developments during April have been entirely favorable so far as efforts to curtail production are concerned, and Henderson Rubber Reports, Inc., on April 11, sum up a cable from London by saying "the cessation of tapping during May would decrease the world output by 33,300 tons."

The success of the restriction agreements is evidenced in the cable referred to above from Henderson's report of April 11.

"At the annual general meeting of the Rubber Growers' Association held today, the Chairman stated that the response to the Liaison Committee's appeal had been extraordinarily good, assent having been obtained from producers in the United Kingdom representing 90 per cent, from Dutch and other European producers excluding British, operating in the D. E. I. 91 per cent, from Malayan local European companies 79 per cent. A measure of support has been obtained from growers in Indo-China, and the only disappointing feature was the poor response from Ceylon local European companies. Although total tonnage was not large, every effort was being made to increase their support.

"The matter for congratulation was the surprising response from large Asiatic producers in Malaya, representing an annual production of 78,000 tons, who have assented to stop tapping in May.

"It was clear that the support received represents in the aggregate an annual production of about 400,000 tons."

Thus, the looked-for curtailment has been assured. Of course, if this favorable condition reflects itself in better prices, there is still "an expansion of production from a large part of the native Dutch area at present untapped" to be feared.

"With the prospect of the Dutch native production increasing, with any material increase in price levels it would seem that advances would be slow. The market holds steady in view of the cessation of tapping during May and we look for increasing steadiness as we approach May 1."

H. Hentz & Co. on April 10 substantiated this view of a steady price level by saying, "The present level of prices has, in our opinion, discounted the bearish factors in the crude rubber situation and we continue to favor the purchase of the forward positions as we believe that a gradual improvement in conditions affecting this market will probably be encountered from now on."

Allowing 3,000 tons for reexport the March rubber imports should approximate consumption which has been estimated at between 38,000 and 39,000 tons. It is indicated that March imports will be smaller than January and February. Arrivals of rubber in January amounted to 47,462 tons and for February 43,728 tons.

The new No. 1 Standard Contract became effective on April 1. The close of the week found stocks of crude rubber at London of 69,233 tons, an increase of 829 tons, and at Liverpool of 21,198 tons, an increase of 11 tons.

Prices at the close of March 29 on A Contracts were:

Position	High	Low	Close	Yesterday's Close
Apr.	15.60	15.50	15.50-15.60	15.50
May	15.90	15.90	15.90	15.80-15.90
June	....	....	16.10	16.00
July	16.40	16.40	16.30-16.40	16.30-16.40
Aug.	....	....	16.50	16.50
Sept.	16.80	16.80	16.80	16.70
Oct.	....	....	17.00	16.90-17.00
Nov.	....	....	17.10	17.00
Dec.	....	....	17.20	17.10-17.20
Jan.	....	....	17.40	17.30
Feb.	....	....	17.60	17.50

RUBBER EXCHANGE ACTIVITIES

Week Ended	Transactions: Contracts Sold: Number	Transactions: Contracts Sold: Tons	Transferable Notices	Week-End Tone
Mar. 29	870	2,175.0	82	Steady
Apr. 5	1,108	2,770.0	108	Quiet
Apr. 12	656	1,640.0	15	Quiet
Apr. 19	1,107	2,767.5	13	Quiet
Apr. 26	1,736	4,340.0	8	Steady
Totals	5,477	13,692.5	226	

Trading was again quiet during the week ended April 5. Early in the week the F. R. Henderson Corp. in its market review reported that "more help is being taken on in order to step up production on April 1. The steadiness on the Rubber Exchange is attributed to a fair demand and better news from manufacturing centers."

The review further states, "It is probable that the market will hold at present levels until more is known regarding the proposed voluntary restriction plan. There seems to be a hesitancy on the part of sellers, pending an announcement by the Anglo-Dutch Committee."

Almost in answer to this statement the Rubber Exchange received a cable from London a day or two later, which carried the official announcement that the total assents to the recommendations of the British-Dutch liaison committee for suspension of rubber tapping during May were more than 80 per cent, whereas 70 per cent was necessary to put the plan into effect. The plan, therefore, becomes operative.

This announcement came from the Rubber Growers' Association of Britain. It was added that advices had been received from Malaya to the effect that substantial support to the tapping suspension idea would be contributed by the Asiatic or native growers of Malaya.

Suspension of tapping of rubber trees in the Far East during the month of May is estimated to total approximately half of world production for that month. This is between 30,000 and 35,000 tons, or 3½ per cent at the most, of world production for the whole year.

Considerable interest was displayed when the new No. 1 Standard rubber futures contract was inaugurated on the Rubber Exchange of New York with 130 tons traded in the first hour.

At London the stocks of crude rubber increased 2,244 tons to a total of 71,477 tons, and at Liverpool there was an increase of 810 tons to a total of 22,008 tons.

Rubber invoiced to the United States is reported to be 8,710 tons for the week ended March 15, and 9,844 tons for the week of March 22, and 8,664 tons for the week of March 29. Prices at the close of

The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND

Positions	"A" Contracts — March, 1930							"No. 1 Standard" Contracts — April, 1930																
1930	24	25	26	27	28	29	31	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18*	19*
March	15.50	15.40	15.00	15.00	15.30	15.40	15.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	15.50	15.50	15.20	15.20	15.50	15.50	15.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
May	15.80	15.80	15.50	15.50	15.80	15.90	15.70	15.72	15.71	15.65	15.35	15.35	15.40	15.40	15.22	15.35	15.40	15.30	15.02	15.05	15.20	15.25	.....	.....
June	16.00	16.00	15.70	15.70	16.00	16.10	15.90	15.93	15.97	15.92	15.63	15.63	15.62	15.62	15.47	15.54	15.63	15.51	15.18	15.22	15.38	15.44	.....	.....
July	16.30	16.30	16.10	16.00	16.30	16.30	16.20	16.29	16.24	16.20	15.90	15.90	15.85	15.85	15.72	15.73	15.86	15.73	15.45	15.40	15.54	15.63	.....	.....
August	16.50	16.50	16.20	16.20	16.50	16.50	16.40	16.48	16.45	16.38	16.10	16.08	16.05	16.05	15.94	15.95	16.06	15.91	15.63	15.57	15.74	15.82	.....	.....
September	16.80	16.70	16.40	16.40	16.70	16.80	16.60	16.68	16.66	16.56	16.30	16.22	16.26	16.27	16.14	16.17	16.26	16.10	15.82	15.75	15.94	15.98	.....	.....
October	17.00	16.90	16.60	16.60	16.90	17.00	16.80	16.85	16.82	16.74	16.46	16.41	16.41	16.43	16.30	16.32	16.43	16.29	16.02	15.98	16.14	16.20	.....	.....
November	17.10	17.00	16.70	16.70	17.00	17.10	17.00	17.02	16.97	16.90	16.61	16.59	16.55	16.59	16.46	16.47	16.59	16.48	16.21	16.18	16.33	16.40	.....	.....
December	17.20	17.10	16.80	16.80	17.10	17.20	17.20	17.19	17.13	17.05	16.77	16.75	16.70	16.76	16.62	16.60	16.76	16.65	16.41	16.38	16.52	16.60	.....	.....
1931																								
January	17.40	17.30	17.00	17.00	17.30	17.40	17.40	17.36	17.36	17.25	16.97	17.00	16.91	16.96	16.84	16.82	16.96	16.85	16.61	16.58	16.72	16.80	.....	.....
February	17.60	17.50	17.20	17.20	17.50	17.60	17.60	17.53	17.56	17.45	17.17	17.20	17.11	17.16	17.04	17.02	17.16	17.05	16.81	16.78	16.92	17.00	.....	.....
March	.....	.....	.....	.....	.....	.....	.....	17.60	17.76	17.65	17.37	17.40	17.31	17.36	17.24	17.22	17.36	17.25	17.01	16.98	17.12	17.20	.....	.....

*Holiday.

April 5, on No. 1 Standard contracts were:

Position	High	Low	Close	Yesterday's Close
May	....	....	15.35	15.35-15.43
June	....	....	15.63	15.63
July	15.90	15.90	15.90	15.90-15.94
Aug.	....	....	16.08	16.10
Sept.	16.34	16.30	16.22	16.30-16.32
Oct.	....	....	16.41	16.46
Nov.	....	....	16.59	16.61
Dec.	....	....	16.75	16.77-16.80
Jan.	....	....	17.00	16.97
Feb.	....	....	17.20	17.17
Mar.	....	....	17.40	17.37

In reference to expanding production schedules planned by tire manufacturers during April the F. R. Henderson Corp. review said this: "It would not be surprising to see a slight upward turn in the market shortly, as manufacturers are planning to increase their daily tire production schedules by 10 to 20 per cent during April, and further support to the proposed tapping holiday in May is being promised from day to day by various producing interests."

In reference to the higher prices mentioned above, a cable from Batavia to the Rubber Exchange of New York commented on the effect on rubber production in the Far East:

"The Department of Agriculture in a review of rubber production by natives in the Dutch East Indies expresses the opinion that the present low price is no reason to fear there will be any sharp increased production in the near future. Should any material advance in rubber prices appear, however, a large part of the area at present untapped will probably be brought into production, in which event an important increase in production may be expected.

"These considerations, the department considers, prove that the only possible course for European estate owners to follow is to reduce their production costs. Compared with 103,500 tons exported last year, the Department estimates potential production for the present year at 150,000 tons. The area not yet tappable is recorded to be 2 or 3 times larger than the present tappable area."

During this week the detailed report on the March Malayan shipments appeared. Shipments to the United States were 28,539 tons against 30,943 tons during February. The United Kingdom received 10,196 tons of the total as compared with 9,980 tons during the previous month. Larger quantities of rubber were sent to the British possessions, Japan, and other countries as compared with February. The gross total in March compared with a total of 49,448 tons during March of last year. Prices at the close of April 12, on "No. 1 Standard" contracts, were:

Position	High	Low	Close	Yesterday's Close
May	....	....	15.30	15.40
June	....	....	15.51	15.63
July	15.78	15.78	15.73-15.78	15.86-15.90
Aug.	....	....	15.91	16.06
Sept.	16.20	16.20	16.10-16.20	16.26-16.28
Oct.	....	....	16.29	16.43
Nov.	....	....	16.48	16.59
Dec.	16.69	16.69	16.65-16.73	16.76-16.78
Jan.	....	....	16.85	16.96
Feb.	....	....	17.50	17.16
Mar.	....	....	17.25	17.36

The Rubber Exchange of New York received the report of the London Board of Trade, which announced that March imports of crude rubber into London totaled 353,638 centals against 328,328 centals in the previous month and 302,737 centals in March last year.

Exports for the month from London were 77,089 centals against 83,645 centals in the previous month and 99,239 centals in March of last year. Of this total, 3,816 centals went to the United States as contrasted with 6,269 centals in February and 6,767 centals in March of last year.

Trading was dull in anticipation of the two-day holiday on Good Friday, April 18, and the following Saturday, April 19. Prices at the close of April 17 on No. 1 Standard contracts were:

Position	High	Low	Close	Yesterday's Close
May	....	....	15.25	15.20
June	....	....	15.44	15.38
July	15.60	15.60	15.63	15.54-15.60
Aug.	....	....	15.82	15.74
Sept.	16.00	15.98	15.98	15.94-16.00
Oct.	....	....	16.20	16.14
Nov.	....	....	16.40	16.33
Dec.	16.54	16.54	16.60	16.52
Jan.	16.80	16.74	16.80	16.72
Feb.	....	....	17.00	16.92
Mar.	....	....	17.20	17.12

The market from Monday to Wednesday, April 21 to 23, inclusive, following the holiday was dull and prices easier. No. 1 standard contracts and "A" contracts declined variously in all positions from 32 to 50 points. Transactions were confined to a few positions, mostly September, December, and January. On all other positions quotations were nominal. On April 23 closing prices on May ribbed smoked sheets No. 1 standard contracts was 14.75 cents nominal and on "A" contracts 14.60 cents on transactions.

There was virtually no factory interest, and the bulk of the activity of the week-end comprised switching operations by large dealers and commission houses into distant months. The closing price of spot ribs on April 26 was 14.10 cents. Prices at the close of April 26 on No. 1 Standard contracts were:

Position	High	Low	Close	Yesterday's Close
May	....	....	14.25	14.35
June	....	....	14.47	14.57
July	....	....	14.70	14.80
Aug.	....	....	14.90	15.01
Sept.	15.20	15.20	15.10-15.20	15.22
Oct.	....	....	15.30	15.41
Nov.	....	....	15.51	15.60
Dec.	....	....	15.72-15.79	15.80
Jan.	....	....	15.92	16.00
Feb.	....	....	16.12	16.20
Mar.	....	....	16.32	16.40

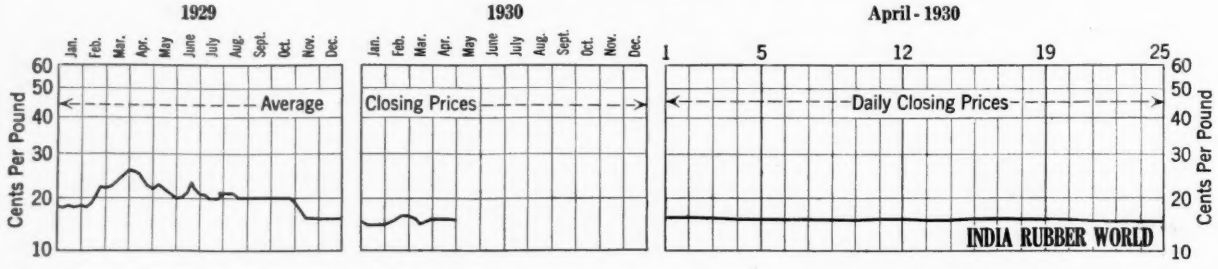
New York Outside Market

Conditions in the New York market for actuals during April exhibited the same lack of activity and consuming demand that characterized the market for March.

The British-Dutch scheme to cease tapping rubber during the month of May was officially announced as agreed upon by plantation interests on April 10. Over 90 per cent of Dutch and English producers assented to the scheme, whereas 70 per cent would have been sufficient to make it effective. It is considered that those assenting represent a tonnage equivalent to one half of the world production.

It is estimated that cessation of tapping in May will effect a limitation of output by 35,000 tons and that this reduction will bring the world's output for the year down to about 820,000 tons or 5,000 tons

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	March, 1930							April, 1930															
	24	25	26	27	28	29	31	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18*	19*
Ribbed smoked sheet	15⅝	15½	15⅜	15⅜	15⅝	15⅝	15⅝	15½	15¼	15⅜	15¼	15¼	15¼	15¼	15⅛	15⅛	15¼	15¼	15	15	15⅛	15⅛	....	....
No. 1 thin latex crepe	15⅞	16	15¾	15¾	16	15⅞	15	15⅞	15⅞	15¾	15⅝	15⅝	15½	15⅝	15⅜	15⅜	15½	15½	15¼	15¼	15⅜	15⅜	....	....
No. 1 thick latex crepe	15⅝	15½	15⅜	15⅜	15⅝	15⅝	15⅝	15½	15½	15⅜	15¼	15¼	15¼	15¼	15⅛	15⅛	15¼	15	15	15	15⅛	15⅛	....	....
No. 1 brown crepe	14½	14⅜	14¼	14¼	14½	14½	14½	14⅜	14⅜	14⅜	14⅛	14¼	14⅛	14⅛	14	14	14	14	13⅞	13⅞	14	14	....	....
No. 2 brown crepe	14⅛	14⅛	13⅞	13⅞	14¼	14¼	14¼	14⅛	14⅛	14⅛	13⅞	13⅞	13⅞	13⅞	13¾	13¾	13¾	13¾	13⅝	13⅝	13¾	13¾	....	....
No. 2 amber	14½	14⅜	14¼	14¼	14½	14½	14⅝	14⅜	14⅜	14⅜	14¼	14¼	14¼	14⅛	14	14	14	14	13⅞	13⅞	14	14	....	....
No. 3 amber	14¼	14⅛	14	14	14⅛	14¼	14⅜	14⅛	14⅛	14⅛	14	13⅞	14	13⅞	13¾	13¾	13¾	13¾	13⅝	13⅝	13¾	13¾	....	....
No. 4 amber	13½	13⅝	13½	13½	13⅝	13⅝	13¾	13¾	13¾	13⅝	13½	13½	13½	13½	13⅜	13⅜	13⅜	13¾	13½	13¼	13⅜	13⅜	....	....
Rolled brown	10	10	9⅞	9⅞	10	9⅞	9⅞	9⅞	9⅞	9¾	9¾	9⅝	9⅝	9¾	9¾	9¾	9¾	9¾	9½	9½	9⅝	9⅝	....	....

* Holiday.

less than the estimated rubber consumption for this year.

Announcement of the adoption of the scheme to cease tapping in May had no appreciable effect on New York prices for crude. The consuming demand in general is of the hand-to-mouth order for supplying current needs. The call for ambers and browns, the so-called remilled grades, is fairly active. These grades are much favored by large and small manufacturers alike not only because of their price advantage over latex crepes and ribs, but because of their adaptability to general compounding for a wide variety of goods.

Well-informed opinion supports the view that the native growers will become much more important as factors in plantation production within comparatively few years because they are the largest producers of ambers and browns, while the growers of the standard grades produce these sub-standard grades only incidentally to their principal output. The drop in price level of these sub-standard grades is less than the standards. Thus the native grower has a distinct and increasing advantage.

Reviewed by weekly periods the outside market presented the following features:

The week that closed March 29 began and ended with spot ribs at 15⅝ cents and deviated but slightly from this figure and that downward, the low figure being 15⅜ cents for both Wednesday and Thursday. The week opened with prices steady, good factory inquiry, and low bids. Manufacturers' interest, however, fell off almost completely as the week progressed. By Saturday the activity had become very restricted and unsatisfactory, and the market for the week closed with standard grades quoted as follows:

Spot	Mar. 29	Month Ago	Year Ago
Crepe	15⅞	16¼	23⅛
Ribs	15⅝	15¾	22⅞
Upriver fine	16½	16¾	24½

The week ended April 5 was marked by steadily declining prices and a falling off in consumers' interest. Spot ribs closed on Monday and Tuesday at 15½ cents, on Wednesday at 15⅜ cents, and on Friday and Saturday at 15¼ cents. As a whole the week was very disappointing to dealers, particularly those who supply the wants of the smaller rubber manufacturers. Factory interest was practically absent most of the week, which closed with standard grades quoted as follows:

Spot	Apr. 5	Month Ago	Year Ago
Crepe	15⅝	15¾	22¾
Ribs	15¼	14⅞	22½
Upriver fine	16½	16½	20¾

During the week terminated April 12 ribs maintained daily the closing price of 15¼ cents except on Wednesday and Thursday when ribs closed at 15⅛ cents. There was virtually no factory interest either of inquiry or buying, apart from small lots for filling in purposes. Manufacturers seem well supplied for current and nearby needs and are waiting for their products to come into more active demand with the advance of spring. The week's closing record is as follows:

Spot	Apr. 12	Month Ago	Year Ago
Crepe	15½	15½	22¾
Ribs	15¼	15	21¾
Upriver fine	16½	16½	23¼

The market was closed on Friday and Saturday of the week ended April 19 on account of Good Friday. The first two days of this week spot ribs closed at 15 cents, but gained ⅛-cent on Wednesday and Thursday. Although ribs were at substantially 15 cents all the week, no factory interest was in evidence. The week's closing record follows:

Spot	Apr. 19	Month Ago	Year Ago
Crepe	15⅜	15⅜	20
Ribs	15⅛	15	19⅝
Upriver fine	16¼	16½	21¾

On April 26 ribs in London declined to a record low of 6 15/16 pence owing to overproduction and lack of consuming interest. The outside market for the week ended April 26 was dull with little factory interest and ribs at the close were 14¼ cents. London and Liverpool stocks at the week's close advanced 1,665 tons to a total of 97,630 tons.

Spot	Apr. 26	Month Ago	Year Ago
Crepe	14⅝	15¾	20¼
Ribs	14⅜	15⅜	19¾
Upriver fine	15¾	16½	21¾

Importations of all grades in March, 1930, were 43,430 tons compared with 53,824 tons one year ago. Plantation arrivals for March were 44,334 tons, compared with 51,661 tons one year ago. Total importations of plantation grades for three months ended March 31 were 133,523 tons, compared with 166,714 tons for the corresponding period of 1929. Total importations of all grades of rubber for the three months ended March 31 were 136,520 tons compared with 170,667 tons for the corresponding period of 1929.

New York Quotations

Following are the New York outside market rubber quotations for one year ago, one month ago, and April 25th, the current date

	April 25, 1929	March 25, 1930	April 25, 1930
Plantation Hevea			
Rubber latex (Hevea)..gal.	$1.40 @	$1.25 @	$1.25 @
CREPE			
No. 1 Thin latex (first latex) spot	.20¼ @ .20½	.15¾ @ .16	.15 @
May-June	.20½ @	.16⅜ @ .16½	.15⅛ @
July-Sept.	.20¾ @	.17 @	.15¾ @
Oct.-Dec.	.21⅛ @	.17½ @ .17¾	.16¼ @
No. 2 Amber, spot ("B" blanket)	.18⅛ @	.14½ @	.14 @
May-June	.18¼ @	.15 @	.14 @
July-Sept.	.18⅜ @	.15½ @	.14¼ @
Oct.-Dec.	.18⅝ @	.16 @	.14¾ @
No. 3 Amber, spot ("C" blanket)	.17⅞ @	.14¼ @	.13¾ @
No. 1 Brown, clean, light, thin	.18⅛ @	.14½ @	.14 @
No. 2 Brown, clean, thin	.17⅞ @	.14¼ @	.13¾ @
Brown, roll	.13 @	.10¼ @	.09½ @
Sheet			
Ribbed smoked spot	.19¾ @	.15½ @ .15⅝	.14½ @
May-June	.19⅞ @	.16 @	.14⅝ @
July-Sept.	.20⅛ @	.16½ @ .16⅝	.15¼ @
Oct.-Dec.	.20¾ @	.17 @ .17¼	.15¾ @
East Indian			
PONTIANAK			
Banjermasin	@	.08 @	.08 @
Pressed block	.16 @	.14 @	.12 @
Sarawak	@	.08 @	.08 @
South American			
PARAS			
Upriver, fine	.21¼ @	.16½ @	.16 @
Upriver, fine	@	*.22 @	*.19¼ @
Upriver, coarse	.12¾ @	.08 @	.07¼ @
Upriver, coarse	@	*.14½ @	*.13 @
Islands, fine	.18 @	.15¾ @	.15 @
Islands, fine	@	*.21½ @	*.19 @
Acre, Bolivian, fine	.21¾ @	.17 @	.16¼ @
Acre, Bolivian, fine	@	*.22½ @	*.19½ @
Beni, Bolivian	.22 @	.17¾ @	.16½ @
Madeira, fine	.21¼ @	.16½ @	.16 @

	April 25, 1929	March 25, 1930	April 25, 1930
South American			
PARAS—*Continued*			
Peruvian, fine	$0.20 @	$0.16 @	$0.16 @
Tapajos, fine	.20 @	.16 @	.15½ @
CAUCHO			
Upper caucho ball	.12¾ @	.08 @	.07⅛ @
Upper caucho ball	@	*.14½ @	*.13 @
Lower caucho ball	.12¾ @	.07¼ @	.06¾ @
Maniçobas			
Ceará negro heads	†.20 @	†.19 @	†.18 @
Ceará scrap	†.12 @	†.11 @	†.10 @
Manicoba, 30% guaranteed	†.22 @	†.21 @	†.20 @
Mangabiera, thin sheet	†.22 @	†.21 @	†.20 @
Centrals			
Central scrap	.11½ @ .12½	.07¾ @	.07 @ .07½
Corinto scrap	@	.07¾ @	.07 @ .07½
Esmeralda sausage	.11½ @ .12½	.07¾ @	.07 @ .07½
Guayule			
Duro, washed and dried	.20 @	.17 @	@
Ampar	.21½ @	.18 @	@
Gutta Percha			
Gutta Siak	.20 @	.16 @	.15½ @
Gutta Soh	@	@	.25 @
Red Macassar	3.00 @	2.50 @	2.25 @ 2.60
Balata			
Block, Ciudad Bolivar	.51 @	.43 @	.43 @
Colombia	@	.39 @	.38 @
Manaos block	.58 @	.41 @	.44 @
Surinam sheet	.52 @	.54 @	.58 @
Amber	.53½ @	.56 @	.60 @
Chicle			
Honduras	‡.68 @	‡.65 @	‡.65 @
Yucatan, fine	‡.68 @	‡.65 @	‡.65 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

RUBBER AFLOAT TO THE UNITED STATES

All figures in long tons.

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
Mar. 29....	5,867	1,335	1,462	..	8,664
Apr. 5.....	7,435	779	2,109	..	10,323
Apr. 12.....	7,026	1,235	1,527	7	9,795
Apr. 19.....	6,013	493	1,109	21	7,636

RUBBER SCRAP

RUBBER scrap grades in general were in only moderate demand during the past month. The increased production of reclaims has not seriously depleted scrap stocks in reclaimers' hands. Accumulations of stocks of scrap in dealers' hands are not large, however, because prices are too low to furnish an incentive for collectors to gather the scrap. Export demand continues at very fair activity.

BOOTS AND SHOES. This grade continues in fair to moderate demand with prices unchanged from a month ago.

INNER TUBES. No. 1 tubes are in good demand. Attention is directed to the fact that this grade is becoming extinct because floating tubes have lost vogue with motorists. No. 2 or gray tubes are in fair demand. Red tubes are also moderately active. White tubes are no longer listed as a market grade.

TIRES. In general the demand is better and seasonal. Prices have advanced on a number of tire grades. This is true of mixed auto tires with beads, black auto peelings, clean mixed solid, and light gravity solid tires.

SOLID TIRES. These are in good demand. The grades are becoming somewhat scarce owing to the replacement of solids by giant pneumatics.

MECHANICALS. All grades are quoted unchanged from a month ago.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills
April 26, 1930

	Prices
Boots and Shoes	
Boots and shoes, black 100 *lb.*	$1.20 @$1.35
Untrimmed arctics...100 *lb.*	.75 @ .85
Tennis shoes and soles 100 *lb.*	.75 @ 1.00
Inner Tubes	
No. 1, floating.....*lb.*	.07 @ .07¼
No. 2, compound.....*lb.*	.03¼ @ .03⅜
Red .....*lb.*	.03 @ .04
Mixed tubes .....*lb.*	.03⅜ @ .03½
Tires	
Pneumatic Standard	
Mixed auto tires with beads .....*ton*	17.50 @18.50
Beadless .....*ton*	24.50 @26.00
Special auto tire stock (S.A.G.) .....*ton*	26.00 @27.50
Auto tire carcass.....*ton*	32.50 @34.00
Black auto peelings....*ton*	29.00 @31.00
Solid	
Clean mixed truck....*ton*	26.00 @27.50
Light gravity.....*ton*	31.00 @33.00
Mechanicals	
Mixed black scrap.....*lb.*	.00¼ @ .01
Hose, air brake.....*ton*	18.00 @18.50
Garden, rubber covered.*lb.*	.00½ @ .00¾
Steam and water, soft.*lb.*	.00½ @ .00⅝
No. 1 red.....*lb.*	.02 @ .02¼
No. 2 red.....*lb.*	.01 @ .01½
White druggists' sundries..*lb.*	.02 @ .02½
Mechanical .....*lb.*	.01½ @ .01¾
Hard Rubber	
No. 1 hard rubber.....*lb.*	.10½ @ .11

RECLAIMED RUBBER

THE tabulated statistics of reclaim for March show an increase in production, consumption, and stocks for that month over February. The outlook for April indicates a continuance of the upward trend for the same items. The facts, however, will not be known until some time in May.

It can be said of reclaim that in April production advanced from about 50 per cent of capacity to 60 per cent. Also that consumption is now proceeding at a higher rate than at any time since the slump in consumption that occurred last December. As predicted last month, the largest factor in the increased demand was the advance in tire production following the improvement of the automobile industry.

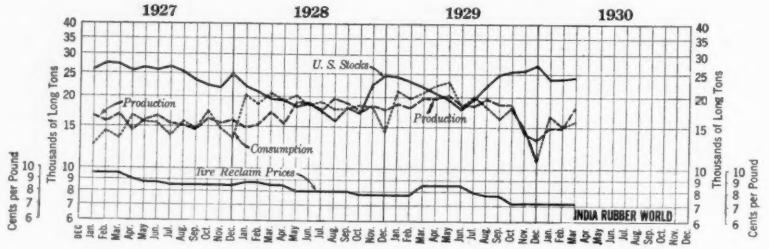
The activity of the insulated wire industry is also serving at the present time as a notable factor in the current demand for reclaims. The rubber footwear industry is busier on tennis and sport shoes than on black goods; therefore its demand for reclaim is lessened at present because tennis and sport shoes are made chiefly with white and colored soles.

Reclaim price quotations for standard reclaims as of April 26 are essentially unchanged from those of a month ago. The only changes noted are a lowering of the spreads on dark gray auto tire and No. 1 and No. 2 inner tube grades, the reductions being ¼-cent down from the upper limits on those grades as quoted for March 25, 1930.

New York Quotations

April 26, 1930

	Spec. Grav.	Price Per Pound
High Tensile		
Super-reclaim, black...	1.20	$0.11¼ @$0.12
red	1.20	.10¾ @ .11
Auto Tire		
Black	1.21	.07 @ .07¼
Black selected tires ...	1.18	.07¼ @ .07½
Dark gray	1.35	.08¼ @ .08½
Light gray	1.38	.09½ @ .10
White	1.40	.11 @ .11½
Shoe		
Unwashed	1.60	.07 @ .07¼
Washed	1.50	.09 @ .09½
Tube		
No. 1	1.00	$0.12 @$0.12¼
No. 2	1.10	.09 @ .09¼
Truck Tire		
Truck tire, heavy gravity	1.55	.07 @ .07¼
Truck tire, light gravity	1.40	.07¼ @ .07½
Miscellaneous		
Red	1.35	.10½ @ .11
Mechanical blends	1.60	.06 @ .06½



Production, Consumption, Stocks, and Prices of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1929					
January	18,685	21,068	49.1	24,394	941
February	18,094	19,829	47.7	23,305	1,028
March	19,984	20,068	46.7	22,076	1,344
April	19,899	22,435	47.3	20,680	1,498
May	20,385	23,176	47.1	19,479	1,299
June	18,416	18,141	42.0	17,980	961
July	18,387	20,236	48.7	19,679	1,202
August	19,787	18,230	47.6	22,309	860
September	18,660	16,416	47.2	24,984	657
October	18,968	18,024	51.8	25,474	830
November	14,363	14,742	53.4	26,080	1,232
December	13,429	11,089	47.1	27,464	869
1930					
January	15,010	16,785	45.8	24,241	954
February	15,847	14,918	45.5	24,241	1,203
March	17,400	15,616	43.2	24,415	....

* Stocks on hand the last of the month or year.
Compiled by Rubber Manufacturers Association.

Compounding Ingredients

PRODUCTION in the rubber industry is on the upward grade. Tire and tube output is advancing with the improvement in the automobile industry. This improvement is expected to gain greater volume in May with the nearer approach of the automobile riding season. The tire output was estimated a month ago at over 50 per cent of capacity and is now somewhat better and gaining gradually.

Mechanical rubber goods production is improving with the general upward trend of general industry. The output of insulated wire is reported much improved as indicated by the larger tonnages of reclaim now being absorbed in that division of rubber goods production. Production of proofed goods and sport rubber footwear is seasonally active.

ACCELERATORS. The full line of accelerators, adaptable for general and special conditions, is in steady demand because of their acknowledged value in the curing economy of all classes of rubber products.

ANTIOXIDANTS. Compounders are coming to a more complete recognition of the different adaptabilities of the ingredients listed as antioxidants and their practical importance in all lines of rubber products. This results in a steadily increasing demand.

BENZOL. The production of benzol is rated at about half that of one year ago. The consuming demand is increasing and the price is firm.

CARBON BLACK. The price is holding firm. An improvement in demand on the part of tire manufacturers was noted in April although it was said to have fallen short of expectations.

It is reported that the plants in Texas produced 140,901,000 pounds of carbon black last year. It is estimated that more than 250,000 pounds of carbon black is going into storage daily in the Panhandle. One authority states that stocks of carbon black have reached the highest point in history and are still increasing at a rapid rate. This overproduction has caused a weakening of the market.

CLAY. Prices are at very low levels. Demand is steady for the customary large tonnages.

LITHARGE. Litharge in casks was reduced to 8 cents a pound early in April following the drop in pig lead.

LITHOPONE. This material is moving well on contracts. Rubber trade interest is improving, and the demand from that source is fair. The price is firm.

MINERAL RUBBER. The better grades of M. R. are in good demand although feeling somewhat the competition of low grade reclaim.

V. M. & P. NAPHTHA. The price is strong and steady and consuming demand fair.

SOFTENERS. All varieties of softeners are in fairly active demand because of their cheapness and essential value in rubber compounding of high and low quality stocks.

STABILIZERS OF CURE. Both the animal and the vegetable acid stabilizers are in steady demand for improving the vulcanizing quality of rubber grades. Prices are firm and steady.

ZINC OXIDE. The prices hold steady as scheduled by producers in November, 1929. Inquiry and rubber consuming demand are improving.

New York Quotations

April 26, 1930

Abrasives			
Pumice stone, pwd.	lb.	$0.02½ @	$0.04
Rottenstone, domestic	ton	23.50 @	28.00
Accelerators, Inorganic			
Lead, carbonate	lb.	.08¼ @	
red	lb.	.09 @	
sublimed blue	lb.	.07¼ @	
sublimed white	lb.	.07¼ @	
super-sublimed white	lb.	.08 @	
Lime, R. M. hydrated	ton	@	
Litharge	lb.	.08 @	
Magnesia, calcined heavy	lb.	.25 @	.30
carbonate	lb.	.06 @	.09
Orange mineral A.A.A.	lb.	.11 @	
Accelerators, Organic			
A-1 (Thiocarbanilid)	lb.	.22 @	.27
A-5-10	lb.	.31 @	.36
A-7	lb.	.55 @	.65
A-11	lb.	.62 @	.75
A-16	lb.	.57 @	.65
A-19	lb.	.58 @	.75
A-20	lb.	.64 @	.80
A-32	lb.	.80 @	.95
Accelerator 49	lb.	.35 @	.40
Aldehyde ammonia	lb.	.65 @	.70
Anhydro formaldehyde aniline	lb.	@	
Butene	lb.	@	
Captax	lb.	@	
Crylene	lb.	@	
paste	lb.	@	
D. B. A.	lb.	@	
D. O. T. G.	lb.	.42 @	.49
D. P. G.	lb.	.30 @	.37
Ethylidine aniline	lb.	@	
Heptene	lb.	@	
base	lb.	@	
Hexamethylenetramine	lb.	.46 @	.47
Lead oleate, No. 999	lb.	@	
Witco	lb.	@	
Lithex	lb.	@	
Methylene dianiline	lb.	@	
Monex	lb.	@	
Phenex	lb.	.70 @	.75
Pipsol	lb.	4.00 @	4.50
Plastone	lb.	@	
R-2	lb.	1.75 @	2.15
base	lb.	4.50 @	5.00
R & H 40	lb.	@	
50	lb.	@	
Safex	lb.	@	
S-P-D-X	lb.	.70 @	.75
Super-sulphur No. 1	lb.	@	
No. 2	lb.	@	
Tensilac 39	lb.	@	
No. 41	lb.	@	
Thermlo F	lb.	@	
Thiocarbanilid	lb.	@	
Trimene	lb.	@	
base	lb.	@	
Tuads	lb.	@	
Ureka	lb.	.70 @	1.00
V. G. B.	lb.	@	
Waxene	lb.	.30 @	.40
Z. B. X.	lb.	@	
Z-88	lb.	.50 @	.60
Zimate	lb.	@	
Acids			
Acetic 28% (bbls.)	100 lbs.	$3.88	@$4.13
glacial (carboys)	**100 lbs.**	**14.18**	**@14.43**
Sulphuric, 66°	ton	15.50 @	
Alkalies			
Caustic soda, 76% solid	100 lbs.	3.76	@ 3.91
Antioxidants			
Age-Rite, powder	lb.	@	
resin	lb.	@	
white	lb.	@	
Albasan	lb.	@	
Antox	lb.	@	
Oxynone	lb.	.68 @	.90
Resistox	lb.	.54 @	.65
Stabilite	lb.	.57 @	.62
Stabilite-Alba	lb.	.70 @	.75
Sunproof	lb.	@	
Binders, Fibrous			
Cotton flock, dark	lb.	.10 @	.11
dyed	lb.	.50 @	.70
white	lb.	.12 @	.25
Colors			
BLACK			
Bone	lb.	.09½ @	
Carbon (see Reenforcers)			
Drop (bbls.)	lb.	**.05½ @**	**.15**
Lampblack (commercial)	lb.	**.07 @**	**.08**
BLUE			
Huber, brilliant	lb.	3.50 @	4.00
Prussian	lb.	.35 @	.37
Ultramarine	lb.	.06 @	.30
BROWN			
Huber mocha	lb.	1.60 @	2.10
Sienna, Italian, raw	lb.	.05½ @	.12½
GREEN			
Chrome, light	lb.	**.27 @**	**.31**
medium	lb.	**.28 @**	**.31**
Chromium oxide	lb.	.33 @	.37
Huber brilliant	lb.	3.75 @	4.25
ORANGE			
Huber Persian	lb.	.50 @	1.00
RED			
Antimony Crimson, R. M. P. No. 3	lb.	.48 @	
RED *(Continued)*			
Sulphur, free	lb.	$0.52 @	
7-A	lb.	.35 @	
Sulphuret, golden No. 60	lb.	@	
7-2	lb.	.22 @	
Huber brilliant	lb.	1.35 @	1.85
Iron Oxides			
bright pure domestic	lb.	.10 @	
bright pure English	lb.	.14 @	
bright reduced English	lb.	.10 @	
bright reduced domestic	lb.	.09 @	
Indian (maroon), pure domestic	lb.	**.10 @**	
Indian (maroon), pure English	lb.	**.11 @**	
Indian (maroon) reduced English	lb.	**.09½ @**	
Indian (maroon) reduced domestic	lb.	.07 @	
Oximony	lb.	**.13¼ @**	
Spanish red oxide	lb.	.02¾ @	.03¾
Sunburnt red	lb.	**.14 @**	
Venetian red	lb.	.02 @	.03¾
WHITE			
Lithopone	lb.	.05½ @	.05¾
Albalith	lb.	.05¼ @	.05½
Azolith	lb.	**.05¼ @**	**.05¾**
Grasselli	lb.	**.05¼ @**	**.05¾**
Titanium oxide, pure	lb.	**.22 @**	
Titanox "B"	lb.	.07¼ @	.07½
Titanox "C"	lb.	.07¾ @	.08
Zinc Oxide			
AAA (lead free) (bbls.)	lb.	.07 @	
Azo (factory):			
ZZZ (lead free)	lb.	**.06½ @**	**.07**
ZZ (leaded)	lb.	**.06¼ @**	**.06¾**
Z (8% leaded)	lb.	**.06¼ @**	**.06¾**
Cryptone	lb.	.07¼ @	.07½
Green seal	lb.	.10⅜ @	.10⅝
Kadox, black label	lb.	.10⅜ @	.10⅝
blue label	lb.	.09⅜ @	.09⅝
red label	lb.	.08 @	.08¼
Red seal	lb.	.09⅜ @	.09⅝
Special	lb.	.07 @	.07¼
White seal	lb.	.11⅝ @	.11⅞
XX green	lb.	.07 @	.07¼
XX red	lb.	.06½ @	.06¾
Zinc sulphide	lb.	.16 @	.16¼
YELLOW			
Cadmium sulphide	lb.	.90 @	1.40
Chrome	lb.	**.17 @**	**.17½**
Huber canary	lb.	2.80 @	3.30
Ochre, domestic	lb.	**.01¼ @**	**.02¼**
French	lb.	.03 @	
Oxide, pure	lb.	**.09 @**	
Zinc, C. P., imported	lb.	**.21 @**	
Factice—See Rubber Substitutes			
Fillers for Pliability			
Flex	lb.	@	
Fumonex	lb.	.04½ @	.08
P-33	lb.	@	
Thermax	lb.	@	
Uncompressed	lb.	.05 @	.10
Velvetex	lb.	.04 @	.06

New York Quotations

April 26, 1930

Fillers, Ordinary

Asbestine ....ton	$13.40	@$13.50
Baryta white (f.o.b. St. Louis, bbls.) ....ton	23.00	@
Baryta white (f.o.b. St. Louis, paper bags) ...ton	22.20	@
Barytes, pure white....ton		@
off color ....ton		@
medium ....ton		@
Foam "A" (f.o.b. St. Louis, bbls.)....ton	23.00	@
Foam "A" (f.o.b. St. Louis, bags) ....ton	23.00	@
Basofor ....lb.	.04½	@
Blanc fixe, dry ....lb.	.04½	@
pulp ....ton	42.50	@45.00
Infusorial earth ....ton	35.00	@
Slate flour, gray (fact'y).ton	7.00	@

Whiting

Domestic ....100 lbs.	1.00	@
English cliffstone..100 lbs.	1.50	@
Imported chalk ...100 lbs.	1.00	@ 1.50
Paris White, English cliffstone ....100 lbs.	1.50	@ 3.50
Quaker ....ton		@
Sussex ....ton		@
Witco (l. c. l.) (f.o.b. New York)..ton		@

Finishes

Mica, amber ....lb.		@
Shellac, fine orange ....lb.	.60	@
Starch, corn ....100 lbs.	3.62	@ 3.82
potato ....lb.	.05½	@ .06

Inflating Material

Ammonium carb. pwd. ..lb.	.13	@ .17
lump ....lb.	.12	@ .16

Lubricants

Soapbark (cut) ....lb.	.09½	@ .10
Soapstone ....ton	15.60	@22.00
Talc, domestic ....ton	16.00	@18.00
French ....ton	18.00	@22.00
Pyrax A ....ton		@

Mineral Rubber

Fluxrite (solid)....lb.		@
Genasco (fact'y)....ton	50.00	@52.00
Gilsonite (fact'y) ....ton	37.14	@39.65
Granulated M. R....ton		@
Hydrocarbon, hard ....ton		@
Ohmlac Kapak, M. R. (f.o.b. fact'y) ....ton	60.00	@
M. 4 (f.o.b. fact'y)...ton	175.00	@
Paradura (fact'y)....ton	62.50	@65.00
Pioneer, M. R., solid fact'y ....ton	40.00	@42.00
M. R. granulated....ton	50.00	@52.00
Robertson, M. R., solid (fact'y) ....ton	34.00	@80.00
M. R. granulated....ton	38.00	@80.00

Oils

Kerosene ....gal.	.123	@
Mineral ....gal.	.20	@

Oils *(Continued)*

Poppy seed oil....gal.	$1.70	@
Rapeseed, refined ....gal.	.67	@ .70
Red oil, distilled ....lb.	.10½	@ .10½
Rubber process ....gal.	.25	@
Spindle ....gal.	.30	@

Reenforcers

Aluminum flake (sacks, c.l.) ....ton	21.85	@
(sacks, l.c.l.) ....ton	24.50	@
Carbon Black		
Aerfloted arrow ....lb.	.05½	@ .11
Century (works, La., c. l.) ....lb.		@
Compressed ....lb.	.05¼	@ .10½
Disperso (works, La., c. l.) ....lb.		@
Excello ....lb.	.05	@
Gastex (f.o.b. fact'y)		
contracts ....lb.	.04	@ .04¾
carload ....lb.	.05½	@
less carload ....lb.	.07	@
Micronex ....lb.	.05½	@ .11
Palmer gas black ....lb.	.05½	@ .11
Supreme ....lb.	.05	@
Clays		
Blue Ridge, dark....ton		@
China imported, pwd..lb.	.01¾	@ .03
Dixie ....ton		@
Langford ....ton		@
Par ....ton		@
Perfection ....ton		@
Suprex ....ton	8.00	@20.00
Glue, high grade....lb.	.25	@ .35

Rubber Substitutes or Factice

Black ....lb.	.08	@ .13
Brown ....lb.	.08	@ .14
White ....lb.	.09	@ .15

Softeners

Burgundy pitch ....100 lbs.	6.00	@
Atlas ....100 lbs.	6.50	@
Corn oil, crude....lb.	.10	@
Cottonseed oil, prime crude ....lb.	.07½	@
Cycline oil ....lb.	.25	@ .34
Degras ....lb.	.03¼	@ .04¼
Fluxol ....ton	18.00	@80.00
Fluxrite (fluid)....lb.		@
Laurex, ton lots ....lb.		@
Palm oil (Lagos) ....lb.	.07¼	@ .07¾
Palm oil (Niger) ....lb.	.06¾	@ .06⅞
Palm oil (Witco) ....lb.		@
Para-flux ....gal.	.17	@
Petrolatum, snow white..lb.	.08	@ .08¾
Pigmentar ....lb.	.02½	@ .03
Pigmentaroil (tank cars, factory) ....gal.	.17	@
(bbls., drums) ....gal.	.24	@
Pine oil, dest distilled...gal.	.55	@ .56
Pine pitch ....bbl.	7.00	@ 8.00
Pine tar (retort) ....bbl.	12.50	@13.00
Rosin K (bbls.) ....280 lbs.	8.00	@

Softeners *(Continued)*

Rosin oil compounded...gal.		@
No. 3, deodorized....gal.	$0.58	@
No. 556, deodorized..gal.	.49	@
Rubber seed, drums....lb.		@
Rubtack ....lb.		@
Stearex ....lb.	.14	@ .20
Stearic acid, double pressed ....lb.	.14½	@ .15
Tackol ....lb.	.09	@ .18
Tonox ....lb.		@
Witco No. 20 ....gal.		@
Woburn oil ....lb.	.05½	@ .06
Wobonite No. 94 ....lb.	.03½	@

Solvents

Benzol (90% drums)...gal.	.27	@
Carbon bisulphide (drums) lb.	.05½	@ .11
tetrachloride (drums) ..lb.	.06¼	@ .10
Dip-Sol ....gal.	.12	@
Dryolene, No. 9 ....gal.	.09½	@
Gasoline		
No. 303		
Drums, c. l. ....gal.	.20	@
Tankcars ....gal.	.16	@
Rub-Sol ....gal.	.08½	@
Solvent naphtha (tanks).gal.	.28	@
Stod-Sol ....gal.	.09	@
Turpentine, Venice ....lb.	.20	@
dest distilled ....gal.	.40	@ .43

Vulcanizing Ingredients

Sulphur		
Rubber sulphur...100 lbs.	1.75	@ 2.50
Soft rubber (c.l.)..100 lbs.		@
(l.c.l.) ....100 lbs.		@
Sulphur chloride....lb.	.03½	@ .04
Superfine commercial flour (bbls.) ....100 lbs.	2.55	@ 3.10
(bags) ....100 lbs.	2.20	@ 2.80
Tire brand, superfine, 100 lbs.	1.75	@
Tube brand, velvet. 100 lbs.	2.30	@
Velvet flour (240 lb. bbls.) ....100 lbs.	2.95	@ 3.50
(150 lb. bags)...100 lbs.	2.60	@ 3.15
Vandex ....lb.		@
(See also Colors—Antimony)		

Waxes

Beeswax, white, com....lb.	.55	@
carnauba ....lb.	.33	@
ceresine, white ....lb.	.12½	@
montan ....lb.	.06½	@
ozokerite, black ....lb.	.28	@
green ....lb.	.28	@

Paraffin

122/124 crude, white scale ....lb.	.03¼	@
124/126 crude, white scale ....lb.	.03¼	@
125/127 fully refined...lb.	.04¼	@

Miscellaneous Supplies

Mold Solution		
Rusco mold paste ....lb.	.12	@ .30

Reported Rubber Stocks

Producing Centers	Long Tons 1929 Oct.	Nov.	Dec.	Long Tons 1930 Jan.	Feb.	Mar.
Singapore	28,582	25,974	27,949	28,475	32,074	32,629
Penang	6,365	4,989	5,208	4,993	5,476	5,500
Para	2,955	3,237	3,103	3,447	3,545	2,857
Totals	37,902	34,200	36,260	36,915	41,095	40,986
Manufacturing Centers						
London	47,803	52,454	54,304	60,434	64,557	69,233
Liverpool	13,903	17,655	18,949	19,849	20,605	21,198
Amsterdam	2,222	2,150	2,179	2,134	2,159	....
United States	88,483	92,219	105,138	120,649	131,748	156,516
Plantations afloat*.	89,200	88,869	90,840	94,828	97,931	....
Totals	241,611	253,347	271,410	297,894	317,000	....
Grand totals	279,513	287,547	307,670	334,809	358,095	....

* W. H. Rickinson & Son, *The World's Rubber Position.*
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Low and High New York Spot Prices

Plantations	April 1930*		1929		1928	
Thin latex crepe	$0.14⅛ @	$0.15⅞	$0.20 @	$0.23¼	$0.16⅞ @	$0.27½
Smoked sheet, ribbed	.14⅛ @	.15½	.19½ @	.23	.16¾ @	.27¼
Paras						
Upriver, fine	.15½ @	.16½	.20½ @	.23½	.16¾ @	.24
Upriver, coarse	.07½ @	.07¾	.12½ @	.14¼	.13¾ @	.21
Upper caucho ball	.07¼ @	.08	.12½ @	.14¼	.13¾ @	.21

* Figured to April 26, 1930.

Ceylon Rubber Exports

January 1 to February 14, 1930

	Tons
To United Kingdom	2,874.64
Continent	928.87
Other countries in Europe	1.47
Australia	283.19
America	8,052.47
Canada and New Foundland	2.50
Other countries in America	22.32
Egypt	2.00
Africa	1.02
India	20.39
Japan	18.62
Total	12,207.49
For the same period last year	12,399.63

Annual Exports, 1922-1929

	Tons
For the year 1929	80,476.44
1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14

Malayan Rubber Returns

An official cable from Kuala Lumpur to the Malayan Information Agency gives the following returns for the month of March, 1930.

Production by Estates of over 100 acres.	Tons
Federated Malaya States	10,926
Straits Settlements	1,905
Johore	3,310
Kedah	1,727

Compounds cured with Accelerator 808

have—exceptionally long range of cure

—high modulus

—high mechanical efficiency

—excellent aging properties

—very good tear resistance
(especially in compounds containing large percentage of carbon black)

—little tendency to scorch

THESE properties are the reason for its widespread use and rapidly increasing list of users. The number of rubber manufacturers using Accelerator 808 has again doubled during the past twelve months. A contributing factor is the efficiency of this product when used with reclaimed rubber.

A partial list of products in which Accelerator 808 is now successfully employed is printed in the column below.

Let us send you a copy of this booklet telling how to get best results with Accelerator 808. Write today.

DU PONT
REG. U. S. PAT. OFF.

Brake Lining
Battery Boxes
Boots and Shoes
Belting: Conveyor, Elevator and Power Transmission Belting (*including Fan Belts*)
Channel Rubber
Diaphragms
Engine Supports
Hose: Air, Garden, Solvent, Steam and Water Hose
Heels
Insulated Wire: Code Wire, 30% Signal Wire and High Grade Cable Covers
Matting
Packing: Red and Black Sheet, also Rod and Plunger Packing
Rubber Covered Rolls: for Printing Machines, Paper Mills, Textile Mills, etc.
Tubing
Tires: Pneumatic and Solid Tires
Inner Tubes: Molded and Mandrel-cured
Valves
Wind-shield Strips

Fine Rubber Chemicals

E. I. DU PONT DE NEMOURS & COMPANY, INCORPORATED, RUBBER CHEMICALS SECTION, WILMINGTON, DEL

Cotton and Fabrics

American Cotton

THE spot price of American middling closed on April 1 at 16.45 cents up 35 points above the closing of the day previous. The price trend was upward and reached maximum on April 7 at 16.75 cents closing. From that date the trend inclined downward, and one week later, on April 15, the decline reached the 16-cent level. A rally of 30 points occurred on April 16, followed by a 10-point decline on April 17. The close that day was 16.20 cents.

On Monday, following the Good Friday holiday, middlings declined to 16 cents, falling the next day to 15.85 cents. From this level it rose 45 points on April 23 closing at 16.30 cents. On April 26 the price was 16.18 cents.

The greatest interest during April was manifested in the old and new crop months of May and July. Average spot prices have varied very little during the month, but speculation has shifted from May to July cotton and vice versa, with corresponding shifts in prices.

Factors in which the April market was interested were outlined by Harriss & Vose in their bulletin of April 12. "At this time of the year the factors that shed light on the next crop prospect are as follows. Acreage estimates, state of preparation and planting, condition of soil and season in the ground, fertilizer sales, and boll weevil emergence."

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Mar. 29	15.93
Apr. 5	16.62
Apr. 12	16.62
Apr. 19	16.21
Apr. 26	16.18

Let us quote further: "Without exception the acreage estimates point to a decrease. The smallest reduction figure presented thus far is 3.7 per cent, which at last year's yield per acre would produce a crop of about 14,250,000 bales.

"Preparation and planting, roughly speaking, seem normal. The condition of the soil is reported good, and the moisture in the ground is satisfactory with the very important exception of West Texas.

"Fertilizer sales are very significant. They are almost equal to last year as a whole, but March showed a sharp decline and, almost certainly, further losses will be registered during the remainder of the season, for the comparison will be with large figures. It seems safe to say that sales will be the smallest in three years.

"The psuedo-scientific figures of boll weevil emergence are no longer issued by the government; they were meaningless and misleading, since it is only summer weather that determines boll weevil damage."

They further state in their bulletin that they do not expect an abnormally large yield per acre and give as their reason the fact that "any prospect at the beginning of April can be so completely overturned by later weather that a freak short crop is just as likely this year as a freak large one."

In answer to the outlook on the weather and on crop conditions we find a pertinent item issued on April 11 by Geo. H. McFadden & Bro.

"Our Mr. Reed has just returned from a trip in the South and reports that, on the whole, the winter has been favorable. There has been sufficient moisture except in the extreme west. The soil is in good condition and plowing well advanced. Feed supplies are apparently adequate to carry the crop, and credit, while tight, will probably be available in sufficient quantity. The use of fertilizer is expected to be somewhat less than last year. The outlook for acreage indicates only a slight reduction from that planted a year ago. The boll weevil menace seems less than last year. Taken as a whole, the crop outlook at this time is better than it has been in April for several years past."

Last month we pointed out the effect of foreign competition when we said, "From

New York Quotations

April 26, 1930

Drills

38-inch 2.00-yard	yard	$0.14½ @
40-inch 3.47-yard		.08⅝ @
50-inch 1.52-yard		.19¾ @
52-inch 1.90-yard		.16 @
52-inch 2.20-yard		.14½ @
52-inch 1.85-yard		.16½ @

Ducks

38-inch 2.00-yard D. F.	yard	.15½ @
40-inch 1.45-yard S. F.		.21⅜ @
72-inch 1.05-yard D. F.		.32⅛ @
72-inch 16.66-ounce		.34⅜ @
72-inch 17.21-ounce		.35½ @

MECHANICAL

Hose and belting	pound	.33 @

TENNIS

52-inch 1.35 yard	yard	.22½ @

Hollands

RED SEAL

36-inch	yard	.14 @
40-inch		.15 @
50-inch		.19½ @

GOLD SEAL

40-inch, No. 72	yard	.18½ @
40-inch, No. 80		.19½ @

Osnaburgs

40-inch 2.35-yard	yard	$0.13 @
40-inch 2.48-yard		.12⅜ @
40-inch 3.00-yard		.10 @
40-inch 10-oz. part waste	lb.	.15¼ @
40-inch 7 oz.	lb.	.11 @
37-inch 2.42-yard	yard	.12⅝ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	.10¼ @
Bombazine 60 x 48		.09¼ @
Plaids 60 x 48		.11½ @
Plaids 48 x 48		.10¾ @
Surface prints 64 x 60		.12½ @
Surface prints 60 x 48		.11½ @
Print cloth, 38½-in., 60 x 48		.05⅛ @
Print cloth 38½-in., 64 x 60		.06⅛ @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.10¼ @
48 x 48, 2.85-yard		.09⅛ @
64 x 68, 3.15-yard		.09⅞ @
56 x 60, 3.60-yard		.08⅝ @
44 x 48, 3.75-yard		.07¼ @
44 x 40, 4.25-yard		.06⅜ @

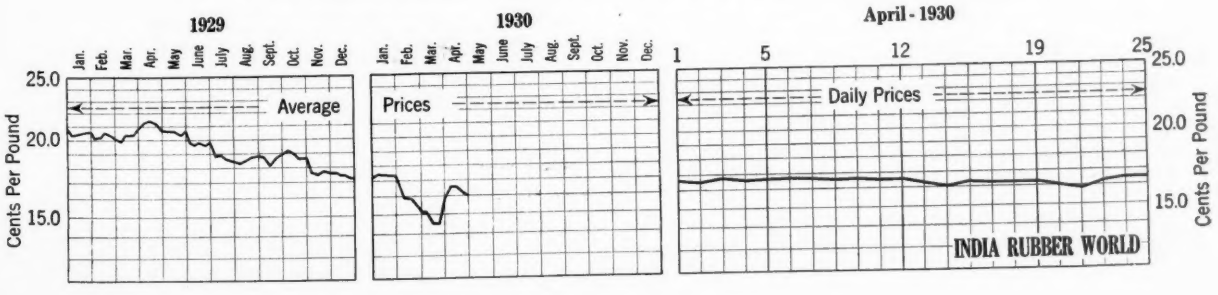
Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.06 @
44 x 40, 6.15-yard		.05 @

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Peeler, karded	pound	$0.42 @
BUILDER 23/11		
Peeler, karded	pound	.42 @
BUILDER 10/5		
Peeler, karded	pound	.39 @
CORD 23/5/3		
Peeler, karded	pound	.42 @
CORD 23/4/3		
Peeler, karded	pound	.44 @
CORD 23/3/5		
Peeler, karded	pound	.47 @
CORD 15/3/5		
Peeler, karded	pound	.40 @
CORD 13/3/3		
Peeler, karded	pound	.39 @
LENO BREAKER		
8-oz. Peeler, karded	pound	.42 @
10-oz. Peeler, karded		.42 @
CHAFER		
9.5-oz. Peeler, karded	pound	.45 @
12-oz. Peeler, karded		.43 @
14-oz. Peeler, karded		.42 @

New York Cotton Exchange Daily Prices of Spot Middling Upland Cotton



over 75 per cent of the world's cotton crop originally contributed by America, our production has decreased recently in relative bulk to but little over 50 per cent."

Alston H. Garside, economist of the New York Cotton Exchange, at the annual convention of the Atlanta Cotton Association in Augusta, Ga., spoke about foreign cotton: "This season one of the new factors which has had a very important bearing on the cotton market has been a muc clearer realization that foreign cottons are competing so seriously with American cotton that they are materially affecting the price of the American staple.

"The most important thing that has happened has been that growers, merchants, spinners, and speculators around the world have, more or less all at once, come to realize that the United States does not produce all the cotton grown in the world, but only about 60 per cent of it."

The Cotton Exchange Service estimates world's consumption of American cotton in February at 1,061,000 bales, compared with 1,237,000 last year, and for the seven months of 8,161,000 bales, or about 700,000 under the mark a year before. The world's supply of American on March 1 was estimated at 10,918 bales, or 268,000 more than last year.

The Cotton Exchange Service places world's consumption of Indian Cotton in the half year ended on February 1 at 3,170,000 bales, against 2,685,000 in the previous season, while world consumption of American staple has fallen considerably below last year's rate. This clearly substantiates Mr. Garside's statement that foreign markets are constantly presenting increasing competition to the United States.

The Department of Agriculture points out the same thing with its figures. While world consumption of American cotton for the first half year was 530,000 bales under that of the same period last season, consumption of foreign growths was 960,000 more, showing the effect of lower prices for foreign-grown staple.

Thus reads a report of H. Hentz & Co.:

"The monthly report of the association of cotton textile merchants of New York showed that sales were 111.8 per cent of production; shipments were 101.6 per cent of production; stocks on hand showed a decrease of 1 per cent, and unfilled orders increased 7.5 per cent. The report was somewhat better than expected, although it could hardly be called bullish, but it had no influence on the trading."

During the week of April 19 weather conditions were a little more favorable, but the size of the crop still depends largely on weather and growing conditions. No more definite figures on reduction have appeared than the estimate of 4 to 8 per cent.

The week ended April 26 was devoted to preparation for first notice day on May delivery contracts. Declines early in the week were recovered on the old crop positions and demand, based on adverse crop condition reports, in Texas and Oklahoma. These declines also provided against need in case of a crop scare in the future. The closing prices of spot middlings rose from 16 cents on Monday to 16.50 cents on Thursday and declined to 16.20 cents on Saturday, April 26.

Staple Cotton

During the past thirty days the staple cotton markets have felt the effect of the proposed duty of 7 cents per pound on the importation of 1⅛-inch and longer staple cottons, but the final net price change has been small.

The announcement that the House and Senate Conference Committee had agreed on the duty was the signal for some fairly heavy buying of immediate shipments from both Liverpool and Alexandria by at least one of the larger rubber companies, by thread manufacturers, and by merchants. The majority of spinners, however, still have fairly heavy stocks of staples on hand and so are content to sit by, hoping for price adjustments between the various world's markets. The growing tendency of foreign spinners to substitute foreign for American cottons is sure to be accelerated by any duty which our government may place on cotton, and it is doubtful if any advantage will accrue to American growers who will be forced to market the bulk of their crops in their home markets.

Acreage reports from the American staple growing regions indicate little if any reduction from last year, but it is, of course, far too early to even guess at a final yield. With normal conditions, however, another very large crop of staples should be produced.

From Egypt comes news of locust invasions and other bullish dope, but there has been little real damage as yet. In the Sudan, however, the crop has received a severe setback and prospects are very doubtful. The total yield in this region is now estimated at under 100,000 bales against hopes of 175,000 bales earlier in the season. The quality is reported inferior to recent years.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The consuming trade is operating on a hand-to-mouth basis. Cotton fabrics are exceedingly low in price, and market conditions remain essentially unchanged from a month ago. Business in cotton fabrics is expected to improve as manufacturing in all lines develops with the advance of spring.

RAINCOAT FABRICS. The activity in raincoat fabrics is moderate and seasonal with outlook favorable for later spring improvement.

SHEETINGS. The grey goods market has been without special feature for the past six weeks, and prices have dropped lower than in many years. In December, 1928, New York spot cotton went to 12.15 cents but 64/60's did not sell below 6½ cents. During the third week of April spot cotton closed at 16 cents; yet the construction mentioned above sold at 6 cents. The usual weights of sheeting entering into rubber goods manufacture are the lowest prices thus far this year, and sales activity is limited.

TIRE FABRICS. During the past month tire fabrics have been in moderately light demand with prices steady and firmer. As April advanced, better inquiry developed and numerous small filling-in lot sales were effected. The demand for Egyptian fabrics also showed some improvement. The consumption of tire fabric, like that of rubber, is now closely adjusted to tire demand on the part of the automobile manufacturers and to tire replacements by motorists.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	3 Months 1930 Number	Per Cent
Motorcycle		
24x3 CC	.....	...
24x3 Std.	132	0.0
26x3 CC	.....	...
28x3 CC	.....	...
18x3 SS	7,652	0.1
19x3 SS	8,854	0.2
Clincher		
30x3½	25,143	0.5
31x4	150	0.0
18" Balloon		
18x3½	645	0.0
18x4	463,675	8.7
18x4½	49,221	0.9
18x3.25	.....	...
18x5	13,406	0.3
19" Balloon		
19x2.75	1,249,876	23.5
19x2.75 DC	31,324	0.6
19x3.00	103,698	1.9
19x3.00 DC	1,134,059	21.3
19x3.25	9,974	0.2
19x3½	108,092	2.0
19x4	726,345	13.7
19x4½	140,146	2.6
19x5	59,780	1.1
20" Balloon		
20x2.75	8,000	0.2
20x3½	24,871	0.5
20x4	32,826	0.6
20x4.00 DC	5,219	0.1
20x4½	60,097	1.1
20x5	1,147	0.0
20x6	606	0.0
21" Balloon		
21x2.75	.....	...
21x3½	41,521	0.8
21x4	7,394	0.1
21x4½	7,423	0.1
21x5	630	0.0
21x6	578	0.0

Rim Size	3 Months 1930 Number	Per Cent
22" Balloon		
22x4	1,358	0.0
22x4½	100	0.0
High Pressure		
30x3½—23	3,197	0.1
32x4½—23	4,682	0.1
32x4—24	2,319	0.0
34x4½—25	2,583	0.0
20" Truck		
30x5	720,378	13.6
32x6	107,142	2.0
34x7	80,086	1.5
36x8	35,436	0.7
40x10	.....	...
40x10.50	190	0.0
9/10-20	2,837	0.1
22" Truck		
36x7	1,570	0.0
38x8	5,400	0.1
9—10/22	76	0.0
24" Truck		
34x5	251	0.0
36x6	4,419	0.1
38x7	3,931	0.1
40x8	15,339	0.3
44x10	383	0.0
9—10/24	905	0.0
Airplane		
8x3	.....	...
12x3	563	0.0
18x3	283	0.0
16x3½	514	0.0
20x3½	.....	...
20x4	.....	...
20x5	.....	...
20x6	209	0.0
20x8	103	0.0
24x10	.....	...
18x4 Cl.	.....	...
Totals	5,316,738	

Reported Rubber Arrivals at New York

Plantations

	Cases
Mar. 15. By "Pres. Hayes," Far East.	
H. Muehlstein & Co., Inc.	*600
Mar. 15. By "Urbino," Far East.	
General Rubber Co.	2,482
Mar. 17. By "Buitenzorg," Far East.	
General Rubber Co.	2,471
Mar. 17. By "Karimoen," Far East.	
General Rubber Co.	1,991
Charles T. Wilson Co., Inc.	900
Mar. 18. By "Pres. Adams," Far East.	
General Rubber Co.	321
H. Muehlstein & Co., Inc.	800
Charles T. Wilson Co., Inc.	1,278
Mar. 19. By "City of Christchurch," Far East.	
General Rubber Co.	112
Charles T. Wilson Co., Inc.	100
Mar. 19. By "Larchbank," Far East.	
General Rubber Co.	1,372
H. Muehlstein & Co., Inc.	1,350
Charles T. Wilson Co., Inc.	500
Mar. 19. By "Silverbelle," Far East.	
General Rubber Co.	5,300
H. Muehlstein & Co., Inc.	350
Charles T. Wilson Co., Inc.	808
Mar. 21. By "Liverpool Maru," Far East.	
H. Muehlstein & Co., Inc.	160
Mar. 21. "Royal Prince," Far East.	
General Rubber Co.	3,542
H. Muehlstein & Co., Inc.	1,160
Charles T. Wilson Co., Inc.	2,352
Mar. 24. By "Manaar," Far East.	
General Rubber Co.	251
Charles T. Wilson Co., Inc.	480
Mar. 25. By "Soekaboemi," Far East.	
General Rubber Co.	3,182
H. Muehlstein & Co., Inc.	260
Charles T. Wilson Co., Inc.	1,075
Mar. 29. By "Polyphemus," Far East.	
General Rubber Co.	2,971
H. Muehlstein & Co., Inc.	900
Charles T. Wilson Co., Inc.	100
Mar. 30. By "Inverbank," Far East.	
Charles T. Wilson Co., Inc.	224
Apr. 2. By "Pres. Harrison," Far East.	
General Rubber Co.	1,728
H. Muehlstein & Co., Inc.	550
Charles T. Wilson Co., Inc.	1,060
Apr. 2. By "Pres. Pierce," Far East.	
H. Muehlstein & Co., Inc.	†250
Apr. 3. By "City of Yokohama," Far East.	
General Rubber Co.	2,126
H. Muehlstein & Co., Inc.	1,890
Charles T. Wilson Co., Inc.	466
Apr. 3. By "Saleier," Far East.	
General Rubber Co.	3,929
Charles T. Wilson Co., Inc.	739
Apr. 4. By "City of Kobe," Far East.	
General Rubber Co.	1,080
H. Muehlstein & Co., Inc.	780
Charles T. Wilson Co., Inc.	910
Apr. 7. By "Troilus," Far East.	
General Rubber Co.	3,145
H. Muehlstein & Co., Inc.	1,140
Charles T. Wilson Co., Inc.	608
Apr. 10. By "Mahout," Far East.	
General Rubber Co.	712
H. Muehlstein & Co., Inc.	840
Charles T. Wilson Co., Inc.	50
Apr. 10. By "Silvermaple," Far East.	
General Rubber Co.	1,977
H. Muehlstein & Co., Inc.	930
Charles T. Wilson Co., Inc.	395
Apr. 11. By "Birchbank," Far East.	
General Rubber Co.	1,188
H. Muehlstein & Co., Inc.	850
Charles T. Wilson Co., Inc.	840
Apr. 11. By "Cedric," Far East.	
General Rubber Co.	30
Apr. 11. By "Cingalese Prince," Far East.	
General Rubber Co.	3,603
H. Muehlstein & Co., Inc.	740
Charles T. Wilson Co., Inc.	492
Apr. 12. By "Steel Traveler," Far East.	
General Rubber Co.	3,047
H. Muehlstein & Co., Inc.	1,140
Charles T. Wilson Co., Inc.	136
Apr. 15. By "Imperial Prince," Far East.	
H. Muehlstein & Co., Inc.	1,430
Charles T. Wilson Co., Inc.	406
Apr. 15. By "Pres. Johnson," Far East.	
H. Muehlstein & Co., Inc.	250
Charles T. Wilson Co., Inc.	168
Apr. 15. By "Tampa," Far East.	
H. Muehlstein & Co., Inc.	400

*Arrived at Los Angeles.
†Arrived at San Francisco.

Balata

Apr. 10. By "Alban," Brazil.	
General Rubber Co.	30

Guayule

Mar. 18. By "El Oceano," Mexico.	
Continental Rubber Co. of N. Y.	560
Mar. 25. By "El Oriente," Mexico.	
Continental Rubber Co. of N. Y.	560
Mar. 31. By "El Coston," Mexico.	
Continental Rubber Co. of N. Y.	560
Apr. 4. By "El Occidente," Mexico.	
Continental Rubber Co. of N. Y.	560
Apr. 15. By "El Oceano," Mexico.	
Continental Rubber Co. of N. Y.	560

Paras and Caucho

Mar. 24. By "Tintoretto," Brazil.	
General Rubber Co.	251
Mar. 31. By "Trafalgar," Brazil.	
H. Muehlstein & Co., Inc.	56
Apr. 10. By "Alban," Brazil.	
General Rubber Co.	659

Rubber Latex

Mar. 19. By "Silverbelle," Far East.	
General Rubber Co.	gals. 62,222

Tire Production Statistics

High Pressure Pneumatic Casings

	All Types			Cord		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	6,106,405	45,633,316	44,446,678	3,728,296	23,631,807	24,233,819
1926	7,842,055	46,104,201	44,253,080	4,047,557	21,800,096	21,359,511
1927	7,697,691	48,331,311	48,052,414	3,649,536	21,527,278	21,741,962
1928	10,217,708	58,457,873	55,721,937	3,580,576	19,302,218	19,351,380
1929	9,470,368	54,980,672	55,515,884	2,290,236	13,765,025	15,016,460
1930						
January	9,539,353	3,558,862	3,525,404	2,382,959	804,783	713,713
February	9,928,838	3,644,606	3,355,844	2,474,495	662,419	599,599

	Balloon Casings			Solid and Cushion Tires		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	1,775,428	15,567,644	14,628,137	148,080	758,900	800,395
1926	3,141,505	21,824,489	20,375,843	164,294	562,041	542,487
1927	3,844,039	26,037,452	25,111,903	158,562	558,030	558,007
1928	6,594,978	38,878,218	35,931,982	152,120	508,223	512,602
1929	7,160,127	41,128,577	40,377,781	122,200	409,344	427,779
1930						
January	7,139,154	2,779,864	2,805,740	126,784	25,049	21,476
February	7,436,247	2,975,922	2,750,324	127,793	22,302	21,005

	High Pressure Inner Tubes			Balloon Inner Tubes		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	6,489,331	45,864,008	45,897,316	1,995,277	16,096,518	14,856,699
1926	8,016,198	33,961,154	32,327,262	4,133,865	23,502,653	21,366,799
1927	5,745,949	27,398,535	29,528,108	4,523,047	25,718,529	25,143,821
1928	5,037,716	23,255,891	23,749,966	7,049,748	36,878,990	34,095,223
1929	3,339,451	16,100,281	17,718,806	6,889,213	38,921,749	38,719,177
1930						
January	3,233,813	783,709	889,208	6,911,422	2,898,682	2,992,752
February	3,243,130	675,126	680,989	7,171,395	3,030,745	2,786,578

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1925	168,295,927	552,389,272	7,780,625,085
1926	165,963,182	518,043,062	9,362,094,000
1927	177,979,818	514,994,728	10,708,068,000
1928	222,243,398	600,423,401	12,512,976,000
1929	208,824,653	627,151,047	14,748,552,000
1930			
January	14,559,163	42,108,149	1,080,660,000
February	13,766,977	40,378,929	1,060,640,000

Rubber Manufacturers Association figures representing 75 per cent of the industry.

World Rubber Absorption

Long Tons

	Annual		12 Months' Running Totals			
	Year 1927	Year 1928	Oct., 1929	Nov., 1929	Dec., 1929	Jan., 1930
CONSUMPTION:						
United States	376,700	441,400	489,273	479,595	472,000	465,466
United Kingdom	44,800	48,504	60,347	68,556	72,023	70,512
NET IMPORTS:						
Australia	9,516	8,430	15,299	15,915	15,886	*15,800
Belgium	6,491	7,958	9,526	9,343	9,445	*9,400
Canada	26,386	30,447	36,047	35,957	35,453	34,546
France	34,274	36,498	56,919	58,701	59,342	*59,300
Germany	38,892	37,855	48,545	48,627	49,078	48,229
Italy	11,290	12,433	17,181	17,116	17,169	15,688
Japan	20,521	25,621	33,964	35,035	34,284	*34,200
Russia	12,695	15,134	*12,000	*12,000	*12,000	*12,000
Other reported†	7,908	10,365	13,855	14,373	14,770	*14,700
Other estimated‡	8,093	*11,000	*11,000	*11,000	*11,000	*11,000
Grand totals	597,566	685,645	803,956	806,218	802,450	790,841
Minus United States	376,700	441,400	489,273	479,595	472,000	465,466
Total foreign	220,866	244,245	314,683	326,623	330,450	325,375

*Provisional figure.
†Includes Czechoslovakia, Denmark, Finland, Netherlands, Norway, Sweden, and Switzerland.
‡Includes Argentina, Austria, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, Spain, and Union of South Africa. Latest annual statistics shown under 1928.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Production—Net Exports

British Malaya	Total 1928	Long Tons 1929 Oct.	Nov.	Dec.	Long Tons 1930 Jan.	Feb.	Mar.
Gross Exports	409,500	47,937	46,279	48,513	52,535	48,947	47,078
Imports	149,787	12,516	11,204	13,451	11,773	12,960	13,236
Net	259,713	35,421	35,075	35,062	40,762	35,987	33,842
Ceylon	57,267	8,411	7,195	8,683	7,741	7,825	6,269
India and Burma	10,790	812	1,065	900	1,560	1,245	....
Sarawak	10,087	1,047	668	930	791	847	....
B. N. Borneo	6,698	*600	*600	*600	*600	*600	*600
Siam	4,813	485	278	320	386	469	....
Java and Madura	58,848	4,697	4,760	5,189	5,709	6,900	....
Sumatra E. Coast	82,511	8,295	6,711	8,279	7,831	7,191	....
Other N. E. Indies	121,671	10,512	9,380	11,102	8,920	11,414	....
French Indo-China	9,616	893	771	966	856	944	643
Amazon Valley	21,129	1,606	1,442	1,674	1,837	1,787	1,674
Other America	1,490	46	104	67	....	....	....
Mexican Guayule	3,076	200	125	100	150	75	....
Africa	5,124	199	306	276	....	....	....
Totals	653,833	73,224	68,480	74,148	....	....	....

* Estimated.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	January, 1929		January, 1930	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	*128,982,327	*$22,877,929	106,391,512	$17,793,563
Latex	.....	.....	912,703	194,703
Jelutong or Pontianak	1,084,422	152,260	1,140,682	141,384
Balata	112,151	34,295	63,533	28,549
Gutta percha	309,532	62,950	.....	.....
Guayule	.....	.....	336,000	55,272
Siak, scrap, and reclaimed	1,940,930	42,149	704,223	9,983
Totals	132,429,362	$23,169,583	109,548,653	$18,223,454
MANUFACTURED—*Dutiable*				
Belting	1,177	$879	282	$128
Tires	21	522	367	9,886
Other rubber manufactures	.....	212,713	.....	133,272
Totals	1,198	$214,114	649	$143,286

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	8,205,861	$1,773,401	7,042,722	$1,077,415
Balata	33,793	13,310	11,713	4,645
Gutta percha, rubber substitutes, and scrap	22,473	4,045	1,266	190
Rubber manufactures	.....	4,785	.....	1,973
Totals	8,262,127	$1,795,541	7,055,701	$1,084,223

EXPORTS OF DOMESTIC MERCHANDISE

RUBBER AND MANUFACTURES				
Reclaimed	2,108,096	$139,410	2,137,309	$143,103
Scrap and old	4,283,318	188,506	4,891,779	210,217
Rubberized automobile cloth, *sq. yd.*	186,107	98,270	147,379	78,019
Other rubberized piece goods and hospital sheeting, *sq. yd.*	152,997	73,730	114,576	46,702
Footwear				
Boots, *pairs*	96,540	203,760	92,710	205,302
Shoes, *pairs*	169,121	152,039	177,575	225,622
Canvas shoes with rubber soles, *pairs*	621,068	389,002	303,887	225,998
Soles, *doz. pairs*	17,337	40,444	18,292	50,951
Heels, *doz. pairs*	133,074	107,362	104,908	78,021
Water bottles and fountain syringes, *number*	43,369	29,878	44,722	24,433
Gloves, *doz. pairs*	6,923	18,768	13,086	32,571
Other druggists' sundries	.....	40,478	.....	26,832
Balloons, *gross*	62,348	65,761	70,021	68,302
Toys and balls	.....	11,859	.....	7,106
Bathing caps, *doz.*	7,260	22,387	6,162	12,356
Bands	52,095	27,355	48,199	23,599
Erasers	46,434	29,307	33,102	21,837
Hard rubber goods				
Electrical goods	125,036	17,116	235,944	26,017
Other goods	.....	39,115	.....	31,890
Tires				
Truck and bus casings, 6 inches and over, *number*	26,527	618,851	36,437	837,001
Other automobile casings, *number*	263,311	2,671,693	158,504	1,411,599
Tubes, auto, *number*	200,319	328,937	128,806	227,032
Other casings and tubes, *number*	21,977	62,400	5,383	18,659
Solid tires for automobiles and motor trucks, *number*	4,509	139,141	2,836	92,029
Other solid tires, *number*	121,157	25,190	150,633	25,491
Tire accessories	.....	129,758	.....	96,883
Rubber and friction tape	147,519	46,787	153,290	42,249
Belting	437,107	231,849	491,250	261,640
Hose	749,128	256,076	683,049	243,717
Packing	235,452	105,352	172,797	99,773
Thread	95,952	106,989	211,673	200,666
Other rubber manufactures	.....	354,503	.....	211,339
Totals	.....	$6,772,073	.....	$5,306,956

*Liquid latex included.

Crude Rubber Imports by Customs Districts

	*February, 1930		Two Months Ended *February, 1930	
	Pounds	Value	Pounds	Value
Massachusetts	3,155,584	$548,819	7,598,538	$1,284,370
New York	85,043,426	13,177,248	181,425,670	29,354,279
Philadelphia	524,444	76,441	2,168,541	331,037
Maryland	880,140	118,514	970,990	134,029
Georgia	470,371	62,122	470,371	62,122
Los Angeles	5,122,251	775,175	8,990,463	1,431,617
San Francisco	187,228	29,388	369,150	59,481
Oregon	11,182	1,709	22,434	3,469
Wisconsin	266,180	44,792	266,180	44,792
Ohio	655,445	117,880	1,170,129	207,775
Colorado	.....	.....	168,000	27,383
Totals	96,316,251	$14,952,088	203,620,466	$32,940,354

*Including latex, dry rubber content.

United Kingdom Statistics

IMPORTS

	February, 1930		Two Months Ended February, 1930	
UNMANUFACTURED				
Crude Rubber	Pounds	Value	Pounds	Value
From—				
Straits Settlements	15,978,500	£528,368	33,288,200	£1,094,272
Federated Malay States	6,563,100	218,401	13,189,300	437,089
British India	2,134,100	69,335	3,936,100	129,301
Ceylon and Dependencies	3,541,300	116,141	7,671,800	249,950
Java and Dutch Borneo	2,257,100	75,030	4,361,300	146,041
Sumatra and other Dutch possessions in Indian Seas	959,300	31,440	2,952,000	95,049
Other countries in East Indies and Pacific not elsewhere specified	302,900	10,462	513,000	17,781
Brazil	567,200	17,725	1,476,200	48,847
South and Central America (except Brazil)	.....	.....	3,200	106
West Africa				
French West and Equatorial Africa	138,400	4,508	138,500	4,511
Gold Coast	18,200	553	56,300	1,807
Other parts of West Africa	71,600	2,308	275,400	10,081
East Africa, including Madagascar	130,000	4,160	200,200	6,365
Other countries	171,100	6,619	456,500	16,722
Totals	32,832,800	£1,085,050	68,518,000	£2,257,922
Gutta percha and balata	369,900	26,318	998,900	80,275
Waste and reclaimed rubber	834,100	9,540	1,630,700	20,535
Rubber substitutes	37,500	659	40,700	738
Totals	34,074,300	£1,121,567	71,188,300	£2,359,470
MANUFACTURED				
Tires and tubes				
*Pneumatic				
Outer covers	.....	£24,494	.....	£43,379
Inner tubes	.....	7,007	.....	11,139
Solid tires	.....	3,819	.....	8,265
Boots and shoes, *doz. pairs*	120,353	128,944	209,039	249,129
Other rubber manufactures	.....	170,189	.....	382,007
Totals	.....	£334,453	.....	£693,919

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	2,008,200	£15,507	4,138,800	£33,547
Rubber substitutes	30,600	656	71,300	1,528
Totals	2,038,800	£16,163	4,210,100	£35,075
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£382,249	.....	£749,123
Inner tubes	.....	41,306	.....	93,277
Solid tires	.....	6,587	.....	14,253
Boots and shoes, *doz. pairs*	17,413	25,261	41,439	60,915
Other rubber manufactures	.....	207,268	.....	426,120
Totals	.....	£662,671	.....	£1,343,688

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED				
Crude rubber				
To—				
Russia	3,271,800	£121,679	5,508,100	£214,545
Sweden, Norway, and Denmark	65,400	3,905	269,100	12,325
Germany	1,751,200	58,869	4,776,500	164,228
Belgium	411,200	15,426	1,188,500	46,942
France	1,499,500	61,257	4,071,800	161,570
Spain	154,500	5,869	202,700	8,109
Italy	267,400	10,238	390,000	15,657
Other countries in Europe	156,700	7,768	826,000	34,035
United States	626,900	18,432	1,649,900	51,919
Other countries	159,900	7,421	289,200	14,246
Totals	8,364,500	£310,864	19,171,800	£723,576
Gutta percha and balata	22,100	2,340	84,700	7,393
Waste and reclaimed rubber	8,600	163	9,800	189
Totals	8,395,200	£313,367	19,266,300	£731,158
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£5,837	.....	£9,872
Inner tubes	.....	923	.....	1,394
Solid tires	.....	.....	.....	60
Boots and shoes, *doz. pairs*	2,642	3,458	3,475	6,201
Other rubber manufactures	.....	6,326	.....	13,540
Totals	.....	£16,544	.....	£31,067

*Motor cars, motorcycles, parts, and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

Dominion of Canada Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	December, 1929		Nine Months Ended December, 1929	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.	4,734,830	$821,708	53,465,767	$11,499,446
Rubber recovered	768,300	50,744	11,975,200	822,482
Rubber, powdered, and gutta percha scrap	849,600	39,481	5,065,700	183,809
Balata	100	199	3,352	2,042
Rubber substitutes	87,600	12,843	1,393,000	130,184
Totals	6,440,430	$924,975	71,903,019	$12,637,963
PARTLY MANUFACTURED				
Hard rubber sheets and rods	9,999	$4,248	75,008	$35,769
Hard rubber tubes	.....	.....	.....	13,543
Rubber thread not covered	35,590	33,808	213,276	202,913
Totals	45,589	$38,056	288,284	$252,225
MANUFACTURED				
Belting	.....	$8,305	.....	$148,065
Boots and shoes, *pairs*	3,780	5,292	51,341	56,211
Cement	.....	2,184	.....	48,375
Clothing, including waterproofed	.....	13,708	.....	414,432
Gaskets	.....	412	.....	17,646
Gloves	.....	1,215	.....	13,985
Golf balls, *doz.*	689	1,819	22,019	65,595
Heels, *pairs*	137,858	5,953	1,354,865	61,627
Hose, including cotton or linen lined with rubber	.....	13,464	.....	223,125
Hot water bottles	.....	2,242	.....	41,108
Mats and matting	.....	6,287	.....	66,698
Packing	.....	3,727	.....	45,208
Tires, bicycle, *number*	406	197	22,881	11,096
Pneumatic, *number*	604	15,065	15,919	223,855
Inner tubes, *number*	85	395	1,930	6,536
Solid for automobiles and motor trucks, *number*	103	2,404	709	19,719
Other solid tires	.....	840	.....	12,905
Other rubber manufactures	.....	89,211	.....	1,150,945
Totals	.....	$172,720	.....	$2,627,131
Totals, rubber imports	.....	$1,135,751	.....	$15,517,319

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

UNMANUFACTURED	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Waste rubber	$9,362	.....	$205,667	.....
Totals	$9,362	.....	$205,667	.....
MANUFACTURED				
Belting	$26,736	.....	$478,775	.....
Canvas shoes with rubber soles	372,337	.....	4,875,051	.....
Boots and shoes	217,739	.....	2,939,374	.....
Clothing, including waterproofed	562	.....	25,179	.....
Hose	29,092	.....	222,268	.....
Tires, bicycle	624	.....	8,267	.....
Pneumatic	802,598	.....	11,666,129	.....
Inner tubes	92,951	.....	1,602,601	.....
Solid rubber	1,941	.....	105,069	.....
Other rubber manufactures	263,734	$4,511	1,896,436	$112,180
Totals	$1,808,314	$4,511	$23,819,149	$112,180
Totals, rubber exports	$1,817,676	$4,511	$24,024,816	$112,180

British Malaya

RUBBER EXPORTS

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for March, 1930, relating to ocean shipments of rubber from Singapore, Penang, Malacca, and Port Swettenham.

Destination of Shipments

	Rubber Tons	Latex Tons
United Kingdom	10,196	27
United States	28,539	150
Continent of Europe	5,235	64
British possessions	713	...
Japan	2,294	1
Other countries	101	...
Totals	47,078	242

Imports During March, 1930

	Dry Rubber Tons	Wet Rubber Tons
Sumatra	581	5,597
Dutch Borneo	599	3,634
Java and other Dutch islands	127	107
Sarawak	1,042	35
British Borneo	257	24
Other countries	932	301
Totals	3,538	9,698

Rubber Questionnaire

Calendar Year 1929*

	Long Tons			
RECLAIMED RUBBER	Inventory at End of Quarters	Production	Shipments	Consumption
Reclaimers solely	8,360	86,691	85,118	156
Manufacturers who also reclaim	9,864	118,233	42,657	93,496
Other manufacturers	3,996	.....	.....	70,617
Totals	22,220	204,924	127,775	164,269

	Long Tons		
SCRAP RUBBER	Inventory	Due on Contract	Consumption
Reclaimers solely	31,419	41,456	112,458
Manufacturers who also reclaim	43,484	64,203	160,460
Other manufacturers	348	.....	.....
Totals	75,251	105,659	272,918

TONS OF RUBBER CONSUMED IN RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS

PRODUCTS Tires and Tire Sundries:	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Automobile and motor truck pneumatic casings	289,118	$578,981,000
Automobile and motor truck pneumatic tubes	56,683	82,931,000
Motorcycle tires (casings and tubes)	259	1,348,000
Bicycle tires (single tubes, casings, and tubes)	1,277	2,877,000
Airplane casings and tubes	178	454,000
Solid and cushion tires	8,990	17,203,000
All other solid tires	805	2,365,000
Tire sundries and repair materials	4,493	16,868,000
Totals	361,803	$703,027,000

PRODUCTS Other Rubber Products:	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Mechanical rubber goods	22,282	$111,195,000
Boots and shoes	18,974	110,856,000
Insulated wire and insulating compounds	3,814	33,126,000
Druggists' sundries, medical, and surgical rubber goods	2,038	8,141,000
Stationers' rubber goods	1,326	2,560,000
Bathing apparel	765	2,987,000
Rubber clothing	1,479	8,536,000
Automobile fabrics	1,277	10,627,000
Other rubberized fabrics	2,354	9,493,000
Hard rubber goods	1,273	6,795,000
Heels and soles	6,318	23,759,000
Rubber flooring	1,122	4,584,000
Sporting goods, toys, and novelties	1,565	7,612,000
Miscellaneous, not included in any of the above items	2,767	11,867,000
Totals	67,354	$352,138,000
Grand totals—all products	429,157	$1,055,165,000

INVENTORY OF RUBBER IN THE UNITED STATES AND AFLOAT

	Long Tons			
ON HAND	Plantation	Para	All Other	Totals
Manufacturers	59,236	1,715	574	61,525
Importers and dealers	39,202	1,845	548	41,595
Totals on hand	98,438	3,560	1,122	103,120
AFLOAT				
Manufacturers	12,101	...	4	12,105
Importers and dealers	39,837	358	50	40,245
Totals afloat	51,938	358	54	52,350

*Number of rubber manufacturers that reported data was 159; crude rubber importers and dealers, 46; reclaimers (solely), 8; total daily average number of employes on basis of third week of each quarter was 166,399.

It is estimated that the reported grand total crude rubber consumption and the grand total sales value figures to be approximately 92 per cent; the grand total crude rubber inventory 87 per cent, and afloat figures 78 per cent; the reclaimed rubber production 91 per cent; reclaimed consumption 77 per cent; and reclaimed inventory 78 per cent of the total of the entire industry.

Compiled from statistics supplied by the Rubber Manufacturers Association, Inc.

London Stocks, Febuary, 1930

	Landed for Feb. Tons	Delivered for Feb. Tons	Stocked February 28		
LONDON			1930 Tons	1929 Tons	1928 Tons
Plantation	9,785	5,653	64,452	25,439	62,827
Other grades	....	....	41	75	89
LIVERPOOL					
Plantation	†1,846	†1,090	†20,605	†4,105	†2,343
Total tons, London and Liverpool	11,631	6,743	85,098	29,619	65,259

† Official returns from the recognized public warehouses.

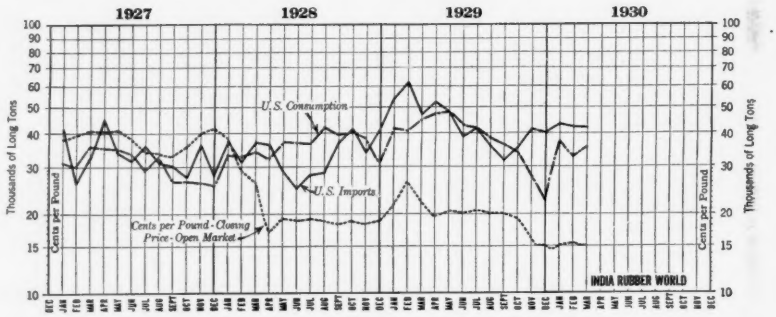
Imports, Consumption, and Stocks

THE accompanying graph represents the official closing prices of the Rubber Trade Association of New York for spot ribbed smoked sheet rubber. Prices have remained around the 15-cent level since November 1, 1929.

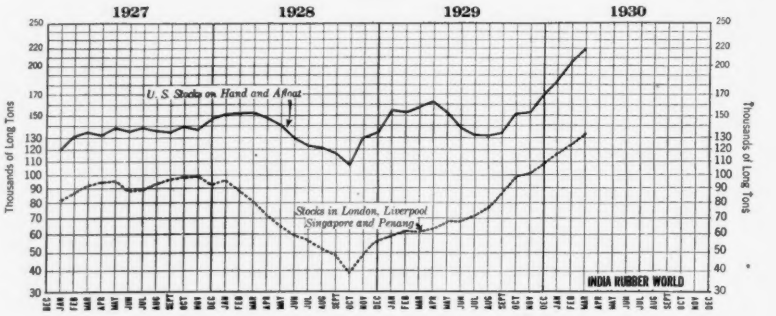
Net imports for March, 1930, were 42,339 tons, an increase of 966 tons from those for February. March consumption was 35,914 tons, an increase of 3,188 tons over that for February. The Henderson Rubber Reports, Inc., estimates April imports at 44,500 tons; consumption, 41,000 tons; stocks afloat, 68,000 tons, and on hand in the United States, 147,500 tons.

These estimates reflect the steady recovery of rubber goods production. This is, of course, largely due to the gradual picking up of the automobile industry and the return of the spring motoring season which involves more or less new tire and tube equipment. Some increase of consumption will doubtless be contributed by mechanicals and footwear.

London stocks between March 22 and April 26 showed steady increase. The weekly record is as follows: March 29, 69,233 tons; April 5, 71,477 tons; April 12, 72,333 tons; April 19, 73,253 tons; April 26, 74,084 tons. The weekly record of Liverpool stocks is: March 29, 21,198 tons; April 5, 22,008 tons; April 12, 22,676 tons; April 19, 22,663 tons; April 26, 23,546 tons. Between March 29 and April 26 Liverpool stocks increased 2,348 tons.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets



United States, British and Malayan Rubber Stocks

United States Statistics of Rubber Imports, Consumption, and Stocks

Twelve Months	*Net Imports Tons	Consumption Tons	Stocks on Hand Tons	Stocks Afloat Tons	Total Domestic Stocks Tons	British and Malayan Stocks: London & Liverpool Tons	British and Malayan Stocks: Singapore & Penang Tons	British and Malayan Stocks: Total Tons
1925	385,596	388,000	50,985	52,421	103,406	6,328	18,840	25,168
1926	399,972	366,000	72,510	51,238	123,748	51,320	26,443	77,763
1927	403,472	373,000	100,130	47,938	148,068	66,261	25,798	92,059
1928	407,572	437,000	66,166	68,764	134,930	22,603	32,905	55,508
1929	527,327	464,644	105,138	62,389	167,527	73,253	35,548	108,801
1929								
January	53,992	42,530	76,342	78,596	154,938	28,966	29,617	58,583
February	61,331	41,137	90.058	63,825	153,883	29,659	32,373	62,032
March	46,391	44,730	100,536	67,065	167,601	32,540	29,437	61,977
April	52.520	47,000	107,659	55,409	163,068	35,958	27,339	63,297
May	48,475	48,692	97,192	55,404	152,596	35,828	31,932	67,760
June	38,821	42,753	92,061	46,035	138,096	35,575	31,861	67,436
July	41,114	41,069	92,535	38,858	131,393	35,599	35,473	71,072
August	35,397	37,854	90,769	41,618	132,387	43,165	33,124	76,289
September	32,912	34,325	84,362	49,480	133,842	52,214	34,291	86,505
October	36,040	34,418	88,483	62,294	150,777	61,706	34,947	96,653
November	41,097	27,355	92,219	62.358	154,577	70,109	30,913	101,922
December	40,588	23,273	105,138	62,389	167,527	73,253	35,548	108,801
1930								
January	44,093	36,669	131,744	61,863	193,607	81,300	33,468	114,768
February	41,373	32,726	143,863	63,404	207,267	87,100	37,550	124,650
March	42,339	35,914	156,516	63,646	220,162	93,500	38,129	131,629

*Including liquid latex, but not guayule.

United States Crude and Waste Rubber Imports for 1930 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1930	Total 1929	Balata	Miscellaneous	Waste
January ..... tons	46,042	362	747	76	10	125	...	47,362	52,305	127	748	35
February	42,510	275	788	66	14	75	...	43,728	64,538	130	543	144
March	44,002	332	894	37	15	150	...	45,430	53,824	123	738	20
Total, three months, 1930..... tons	132,554	969	2,429	179	39	350	...	136,520	.....	380	2,029	199
Total, three months, 1929..... tons	*166,714	...	3,697	105	138	...	13	.....	170,667	232	2,844	570

* Latex included.

Compiled from Rubber Manufacturers Association statistics.

over 75 per cent of the world's cotton crop originally contributed by America, our production has decreased recently in relative bulk to but little over 50 per cent."

Alston H. Garside, economist of the New York Cotton Exchange, at the annual convention of the Atlanta Cotton Association in Augusta, Ga., spoke about foreign cotton: "This season one of the new factors which has had a very important bearing on the cotton market has been a much clearer realization that foreign cottons are competing so seriously with American cotton that they are materially affecting the price of the American staple.

"The most important thing that has happened has been that growers, merchants, spinners, and speculators around the world have, more or less all at once, come to realize that the United States does not produce all the cotton grown in the world, but only about 60 per cent of it."

The Cotton Exchange Service estimates world's consumption of American cotton in February at 1,061,000 bales, compared with 1,237,000 last year, and for the seven months of 8,161,000 bales, or about 700,000 under the mark a year before. The world's supply of American on March 1 was estimated at 10,918 bales, or 268,000 more than last year.

The Cotton Exchange Service places world's consumption of Indian Cotton in the half year ended on February 1 at 3,170,000 bales, against 2,685,000 in the previous season, while world consumption of American staple has fallen considerably below last year's rate. This clearly substantiates Mr. Garside's statement that foreign markets are constantly presenting increasing competition to the United States.

The Department of Agriculture points out the same thing with its figures. While world consumption of American cotton for the first half year was 530,000 bales under that of the same period last season, consumption of foreign growths was 960,000 more, showing the effect of lower prices for foreign-grown staple.

Thus reads a report of H. Hentz & Co.: "The monthly report of the association of cotton textile merchants of New York showed that sales were 111.8 per cent of production; shipments were 101.6 per cent of production; stocks on hand showed a decrease of 1 per cent, and unfilled orders increased 7.5 per cent. The report was somewhat better than expected, although it could hardly be called bullish, but it had no influence on the trading."

During the week of April 19 weather conditions were a little more favorable, but the size of the crop still depends largely on weather and growing conditions. No more definite figures on reduction have appeared than the estimate of 4 to 8 per cent.

The week ended April 26 was devoted to preparation for first notice day on May delivery contracts. Declines early in the week were recovered on the old crop positions and demand, based on adverse crop condition reports, in Texas and Oklahoma. These declines also provided against need in case of a crop scare in the future. The closing prices of spot middlings rose from 16 cents on Monday to 16.50 cents on Thursday and declined to 16.20 cents on Saturday, April 26.

Staple Cotton

During the past thirty days the staple cotton markets have felt the effect of the proposed duty of 7 cents per pound on the importation of 1⅛-inch and longer staple cottons, but the final net price change has been small.

The announcement that the House and Senate Conference Committee had agreed on the duty was the signal for some fairly heavy buying of immediate shipments from both Liverpool and Alexandria by at least one of the larger rubber companies, by thread manufacturers, and by merchants. The majority of spinners, however, still have fairly heavy stocks of staples on hand and so are content to sit by, hoping for price adjustments between the various world's markets. The growing tendency of foreign spinners to substitute foreign for American cottons is sure to be accelerated by any duty which our government may place on cotton, and it is doubtful if any advantage will accrue to American growers who will be forced to market the bulk of their crops in their home markets.

Acreage reports from the American staple growing regions indicate little if any reduction from last year, but it is, of course, far too early to even guess at a final yield. With normal conditions, however, another very large crop of staples should be produced.

From Egypt comes news of locust invasions and other bullish dope, but there has been little real damage as yet. In the Sudan, however, the crop has received a severe setback and prospects are very doubtful. The total yield in this region is now estimated at under 100,000 bales against hopes of 175,000 bales earlier in the season. The quality is reported inferior to recent years.

Cotton Fabrics

Ducks, Drills, and Osnaburgs. The consuming trade is operating on a hand-to-mouth basis. Cotton fabrics are exceedingly low in price, and market conditions remain essentially unchanged from a month ago. Business in cotton fabrics is expected to improve as manufacturing in all lines develops with the advance of spring.

Raincoat Fabrics. The activity in raincoat fabrics is moderate and seasonal with outlook favorable for later spring improvement.

Sheetings. The grey goods market has been without special feature for the past six weeks, and prices have dropped lower than in many years. In December, 1928, New York spot cotton went to 12.15 cents but 64/60's did not sell below 6½ cents. During the third week of April spot cotton closed at 16 cents; yet the construction mentioned above sold at 6 cents. The usual weights of sheeting entering into rubber goods manufacture are the lowest prices thus far this year, and sales activity is limited.

Tire Fabrics. During the past month tire fabrics have been in moderately light demand with prices steady and firmer. As April advanced, better inquiry developed and numerous small filling-in lot sales were effected. The demand for Egyptian fabrics also showed some improvement. The consumption of tire fabric, like that of rubber, is now closely adjusted to tire demand on the part of the automobile manufacturers and to tire replacements by motorists.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	3 Months Number	1930 Per Cent
Motorcycle		
24x3 CC	.....	...
24x3 Std.	132	0.0
26x3 CC	.....	...
28x3 CC	.....	...
18x3 SS	7,652	0.1
19x3 SS	8,854	0.2
Clincher		
30x3½	25,143	0.5
31x4	150	0.0
18" Balloon		
18x3½	645	0.0
18x4	463,675	8.7
18x4½	49,221	0.9
18x3.25	.....	...
18x5	13,406	0.3
19" Balloon		
19x2.75	1,249,876	23.5
19x2.75 DC	31,324	0.6
19x3.00	103,698	1.9
19x3.00 DC	1,134,059	21.3
19x3.25	9,974	0.2
19x3½	108,092	2.0
19x4	726,345	13.7
19x4½	140,146	2.6
19x5	59,780	1.1
20" Balloon		
20x2.75	8,000	0.2
20x3½	24,871	0.5
20x4	32,826	0.6
20x4.00 DC	5,219	0.1
20x4½	60,097	1.1
20x5	1,147	0.0
20x6	606	0.0
21" Balloon		
21x2.75	.....	...
21x3½	41,521	0.8
21x4	7,394	0.1
21x4½	7,423	0.1
21x5	630	0.0
21x6	578	0.0

Rim Size	3 Months Number	1930 Per Cent
22" Balloon		
22x4	1,358	0.0
22x4½	100	0.0
High Pressure		
30x3½—23	3,197	0.1
32x4½—23	4,682	0.1
32x4—24	2,319	0.0
34x4½—25	2,583	0.0
20" Truck		
30x5	720,378	13.6
32x6	107,142	2.0
34x7	80,086	1.5
36x8	35,436	0.7
40x10	.....	...
40x10.50	190	0.0
9/10-20	2,837	0.1
22" Truck		
36x7	1,570	0.0
38x8	5,400	0.1
9—10/22	76	0.0
24" Truck		
34x5	251	0.0
36x6	4,419	0.1
38x7	3,931	0.1
40x8	15,339	0.3
44x10	383	0.0
9—10/24	905	0.0
Airplane		
8x3	.....	...
12x3	563	0.0
18x3	283	0.0
16x3½	514	0.0
20x3½	.....	...
20x4	.....	...
20x5	.....	...
20x6	209	0.0
20x8	103	0.0
24x10	.....	...
18x4 Cl.	.....	...
Totals	5,316,738	

Reported Rubber Arrivals at New York

Plantations

	Cases
Mar. 15. By "Pres. Hayes," Far East.	
H. Muehlstein & Co., Inc.	*600
Mar. 15. By "Urbino," Far East.	
General Rubber Co.	2,482
Mar. 17. By "Buitenzorg," Far East.	
General Rubber Co.	2,471
Mar. 17. By "Karimoen," Far East.	
General Rubber Co.	1,991
Charles T. Wilson Co., Inc.	900
Mar. 18. By "Pres. Adams," Far East.	
General Rubber Co.	321
H. Muehlstein & Co., Inc.	800
Charles T. Wilson Co., Inc.	1,279
Mar. 19. By "City of Christchurch," Far East.	
General Rubber Co.	112
Charles T. Wilson Co., Inc.	100
Mar. 19. By "Larchbank," Far East.	
General Rubber Co.	1,372
H. Muehlstein & Co., Inc.	1,350
Charles T. Wilson Co., Inc.	500
Mar. 19. By "Silverbelle," Far East.	
General Rubber Co.	5,300
H. Muehlstein & Co., Inc.	350
Charles T. Wilson Co., Inc.	808
Mar. 21. By "Liverpool Maru," Far East.	
H. Muehlstein & Co., Inc.	160
Mar. 21. "Royal Prince," Far East.	
General Rubber Co.	3,542
H. Muehlstein & Co., Inc.	1,160
Charles T. Wilson Co., Inc.	2,352
Mar. 24. By "Manaar," Far East.	
General Rubber Co.	251
Charles T. Wilson Co., Inc.	480
Mar. 25. By "Soekaboemi," Far East.	
General Rubber Co.	3,182
H. Muehlstein & Co., Inc.	260
Charles T. Wilson Co., Inc.	1,075
Mar. 29. By "Polyphemus," Far East.	
General Rubber Co.	2,971
H. Muehlstein & Co., Inc.	900
Charles T. Wilson Co., Inc.	100
Mar. 30. By "Inverbank," Far East.	
Charles T. Wilson Co., Inc.	224
Apr. 2. By "Pres. Harrison," Far East.	
General Rubber Co.	1,728
H. Muehlstein & Co., Inc.	550
Charles T. Wilson Co., Inc.	1,060
Apr. 2. By "Pres. Pierce," Far East.	
H. Muehlstein & Co., Inc.	†250
Apr. 3. By "City of Yokohama," Far East.	
General Rubber Co.	2,126
H. Muehlstein & Co., Inc.	1,890
Charles T. Wilson Co., Inc.	466
Apr. 3. By "Saleier," Far East.	
General Rubber Co.	3,929
Charles T. Wilson Co., Inc.	739
Apr. 4. By "City of Kobe," Far East.	
General Rubber Co.	1,080
H. Muehlstein & Co., Inc.	780
Charles T. Wilson Co., Inc.	910
Apr. 7. By "Troilus," Far East.	
General Rubber Co.	3,145
H. Muehlstein & Co., Inc.	1,140
Charles T. Wilson Co., Inc.	608
Apr. 10. By "Mahout," Far East.	
General Rubber Co.	712
H. Muehlstein & Co., Inc.	840
Charles T. Wilson Co., Inc.	50
Apr. 10. By "Silvermaple," Far East.	
General Rubber Co.	1,977
H. Muehlstein & Co., Inc.	930
Charles T. Wilson Co., Inc.	395
Apr. 11. By "Birchbank," Far East.	
General Rubber Co.	1,188
H. Muehlstein & Co., Inc.	850
Charles T. Wilson Co., Inc.	840
Apr. 11. By "Cedric," Far East.	
General Rubber Co.	30
Apr. 11. By "Cingalese Prince," Far East.	
General Rubber Co.	3,603
H. Muehlstein & Co., Inc.	740
Charles T. Wilson Co., Inc.	492
Apr. 12. By "Steel Traveler," Far East.	
General Rubber Co.	3,047
H. Muehlstein & Co., Inc.	1,140
Charles T. Wilson Co., Inc.	136
Apr. 15. By "Imperial Prince," Far East.	
H. Muehlstein & Co., Inc.	1,430
Charles T. Wilson Co., Inc.	406
Apr. 15. By "Pres. Johnson," Far East.	
H. Muehlstein & Co., Inc.	250
Charles T. Wilson Co., Inc.	168
Apr. 15. By "Tampa," Far East.	
H. Muehlstein & Co., Inc.	400

*Arrived at Los Angeles.
†Arrived at San Francisco.

Balata

Apr. 10. By "Alban," Brazil.	
General Rubber Co.	30

Guayule

Mar. 18. By "El Oceano," Mexico.	
Continental Rubber Co. of N. Y.	560
Mar. 25. By "El Oriente," Mexico.	
Continental Rubber Co. of N. Y.	560
Mar. 31. By "El Coston," Mexico.	
Continental Rubber Co. of N. Y.	560
Apr. 4. By "El Occidente," Mexico.	
Continental Rubber Co. of N. Y.	560
Apr. 15. By "El Oceano," Mexico.	
Continental Rubber Co. of N. Y.	560

Paras and Caucho

Mar. 24. By "Tintoretto," Brazil.	
General Rubber Co.	251
Mar. 31. By "Trafalgar," Brazil.	
H. Muehlstein & Co., Inc.	56
Apr. 10. By "Alban," Brazil.	
General Rubber Co.	659

Rubber Latex

Mar. 19. By "Silverbelle," Far East.	
General Rubber Co.	gals. 62,222

Tire Production Statistics

High Pressure Pneumatic Casings

	All Types			Cord		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	6,106,405	45,633,316	44,446,678	3,728,296	23,631,807	24,233,819
1926	7,842,055	46,104,201	44,253,080	4,047,557	21,800,096	21,359,511
1927	7,697,691	48,331,311	48,052,414	3,649,536	21,527,278	21,741,962
1928	10,217,708	58,457,873	55,721,937	3,580,576	19,302,218	19,351,380
1929	9,470,368	54,980,672	55,515,884	2,290,236	13,765,025	15,016,460
1930						
January	9,539,353	3,558,862	3,525,404	2,382,959	804,783	713,713
February	9,928,838	3,644,606	3,355,844	2,474,495	662,419	599,599

	Balloon Casings			Solid and Cushion Tires		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	1,775,428	15,567,644	14,628,137	148,080	758,900	800,395
1926	3,141,505	21,824,489	20,375,843	164,294	562,041	542,487
1927	3,844,039	26,037,452	25,111,903	158,562	558,030	558,007
1928	6,594,978	38,878,218	35,931,982	152,120	508,223	512,602
1929	7,160,127	41,128,577	40,377,781	122,200	409,344	427,779
1930						
January	7,139,154	2,779,864	2,805,740	126,784	25,049	21,476
February	7,436,247	2,975,922	2,750,324	127,793	22,302	21,005

	High Pressure Inner Tubes			Balloon Inner Tubes		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1925	6,489,331	45,864,008	45,897,316	1,995,277	16,096,518	14,856,699
1926	8,016,198	33,961,154	32,327,262	4,133,865	23,502,653	21,366,799
1927	5,745,949	27,398,535	29,528,108	4,523,047	25,718,529	25,143,821
1928	5,037,716	23,255,891	23,749,966	7,049,748	36,878,990	34,095,223
1929	3,339,451	16,100,281	17,718,806	6,889,213	38,921,749	38,719,177
1930						
January	3,233,813	783,709	889,208	6,911,422	2,898,682	2,992,752
February	3,243,130	675,126	680,989	7,171,395	3,030,745	2,786,578

Cotton and Rubber Consumption

	Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1925	168,295,927	552,389,272	7,780,625,085
1926	165,963,182	518,043,062	9,362,094,000
1927	177,979,818	514,994,728	10,708,068,000
1928	222,243,398	600,423,401	12,512,976,000
1929	208,824,653	627,151,047	14,748,552,000
1930			
January	14,559,163	42,108,149	1,080,660,000
February	13,766,977	40,378,929	1,060,640,000

Rubber Manufacturers Association figures representing 75 per cent of the industry.

World Rubber Absorption

Long Tons

	Annual		12 Months' Running Totals			
	Year 1927	Year 1928	Oct., 1929	Nov., 1929	Dec., 1929	Jan., 1930
CONSUMPTION:						
United States	376,700	441,400	489,273	479,595	472,000	465,466
United Kingdom	44,800	48,504	60,347	68,556	72,023	70,512
NET IMPORTS:						
Australia	9,516	8,430	15,299	15,915	15,886	*15,800
Belgium	6,491	7,958	9,526	9,343	9,445	*9,400
Canada	26,386	30,447	36,047	35,957	35,453	34,546
France	34,274	36,498	56,919	58,701	59,342	*59,300
Germany	38,892	37,855	48,545	48,627	49,078	48,229
Italy	11,290	12,433	17,181	17,116	17,169	15,688
Japan	20,521	25,621	33,964	35,035	34,284	*34,200
Russia	12,695	15,134	*12,000	*12,000	*12,000	*12,000
Other reported†	7,908	10,365	13,855	14,373	14,770	*14,700
Other estimated‡	8,093	*11,000	*11,000	*11,000	*11,000	*11,000
Grand totals	597,566	685,645	803,956	806,218	802,450	790,841
Minus United States	376,700	441,400	489,273	479,595	472,000	465,466
Total foreign	220,866	244,245	314,683	326,623	330,450	325,375

*Provisional figure.
†Includes Czechoslovakia, Denmark, Finland, Netherlands, Norway, Sweden, and Switzerland.
‡Includes Argentina, Austria, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, Spain, and Union of South Africa. Latest annual statistics shown under 1928.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Production—Net Exports

	Total 1928	Long Tons 1929 Oct.	Nov.	Dec.	Long Tons 1930 Jan.	Feb.	Mar.
British Malaya							
Gross Exports	409,500	47,937	46,279	48,513	52,535	48,947	47,078
Imports	149,787	12,516	11,204	13,451	11,773	12,960	13,236
Net	259,713	35,421	35,075	35,062	40,762	35,987	33,842
Ceylon	57,267	8,411	7,195	8,683	7,741	7,825	6,269
India and Burma	10,790	812	1,065	900	1,560	1,245	....
Sarawak	10,087	1,047	668	930	791	847	....
B. N. Borneo	6,698	*600	*600	*600	*600	*600	*600
Siam	4,813	485	278	320	386	469	....
Java and Madura	58,848	4,697	4,760	5,189	5,709	6,900	....
Sumatra E. Coast	82,511	8,295	6,711	8,279	7,831	7,191	....
Other N. E. Indies	121,671	10,512	9,380	11,102	8,920	11,414	....
French Indo-China	9,616	893	771	966	856	944	643
Amazon Valley	21,129	1,606	1,442	1,674	1,837	1,787	1,674
Other America	1,490	46	104	67	....	....	....
Mexican Guayule	3,076	200	125	100	150	75	....
Africa	6,124	199	306	276	....	....	....
Totals	653,833	73,224	68,480	74,148	....	....	....

* Estimated.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	January, 1929		January, 1930	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	*128,982,327	*$22,877,929	106,391,512	$17,793,563
Latex	.....	.....	912,703	194,703
Jelutong or Pontianak	1,084,422	152,260	1,140,682	141,384
Balata	112,151	34,295	63,533	28,549
Gutta percha	309,532	62,950	.....	.....
Guayule	.....	.....	336,000	55,272
Siak, scrap, and reclaimed	1,940,930	42,149	704,223	9,983
Totals	132,429,362	$23,169,583	109,548,653	$18,223,454
MANUFACTURED—*Dutiable*				
Belting	1,177	$879	282	$128
Tires	21	522	367	9,886
Other rubber manufactures	.....	212,713	.....	133,272
Totals	1,198	$214,114	649	$143,286

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	8,205,861	$1,773,401	7,042,722	$1,077,415
Balata	33,793	13,310	11,713	4,645
Gutta percha, rubber substitutes, and scrap	22,473	4,045	1,266	190
Rubber manufactures	.....	4,785	.....	1,973
Totals	8,262,127	$1,795,541	7,055,701	$1,084,223

EXPORTS OF DOMESTIC MERCHANDISE

RUBBER AND MANUFACTURES				
Reclaimed	2,108,096	$139,410	2,137,309	$143,103
Scrap and old	4,283,318	188,506	4,891,779	210,217
Rubberized automobile cloth, *sq. yd.*	186,107	98,270	147,379	78,019
Other rubberized piece goods and hospital sheeting, *sq. yd.*	152,997	73,730	114,576	46,702
Footwear				
Boots, *pairs*	96,540	203,760	92,710	205,302
Shoes, *pairs*	169,121	152,039	177,575	225,622
Canvas shoes with rubber soles, *pairs*	621,068	389,002	303,887	225,998
Soles, *doz. pairs*	17,337	40,444	18,292	50,951
Heels, *doz. pairs*	133,074	107,362	104,908	78,021
Water bottles and fountain syringes, *number*	43,369	29,878	44,722	24,433
Gloves, *doz. pairs*	6,923	18,768	13,086	32,571
Other druggists' sundries	.....	40,478	.....	26,832
Balloons, *gross*	62,348	65,761	70,021	68,302
Toys and balls	.....	11,859	.....	7,106
Bathing caps, *doz.*	7,260	22,387	6,162	12,356
Bands	52,095	27,355	48,199	23,599
Erasers	46,434	29,307	33,102	21,837
Hard rubber goods				
Electrical goods	125,036	17,116	235,944	26,017
Other goods	.....	39,115	.....	31,890
Tires				
Truck and bus casings, 6 inches and over, *number*	26,527	618,851	36,437	837,001
Other automobile casings, *number*	263,311	2,671,693	158,504	1,411,599
Tubes, auto, *number*	200,319	328,937	128,806	227,032
Other casings and tubes, *number*	21,977	62,400	5,383	18,659
Solid tires for automobiles and motor trucks, *number*	4,509	139,141	2,836	92,029
Other solid tires, *number*	121,157	25,190	150,633	25,491
Tire accessories	.....	129,758	.....	96,883
Rubber and friction tape	147,519	46,787	153,290	42,249
Belting	437,107	231,849	491,250	261,640
Hose	749,128	256,076	683,049	243,717
Packing	235,452	105,352	172,797	99,773
Thread	95,952	106,989	211,673	200,666
Other rubber manufactures	.....	354,503	.....	211,339
Totals	.....	$6,772,073	.....	$5,306,956

*Liquid latex included.

Crude Rubber Imports by Customs Districts

	*February, 1930		Two Months Ended *February, 1930	
	Pounds	Value	Pounds	Value
Massachusetts	3,155,584	$548,819	7,598,538	$1,284,370
New York	85,043,426	13,177,248	181,425,670	29,354,279
Philadelphia	524,444	76,441	2,168,541	331,037
Maryland	880,140	118,514	970,990	134,029
Georgia	470,371	62,122	470,371	62,122
Los Angeles	5,122,251	775,175	8,990,463	1,431,617
San Francisco	187,228	29,388	369,150	59,481
Oregon	11,182	1,709	22,434	3,469
Wisconsin	266,180	44,792	266,180	44,792
Ohio	655,445	117,880	1,170,129	207,775
Colorado	.....	.....	168,000	27,383
Totals	96,316,251	$14,952,088	203,620,466	$32,940,354

*Including latex, dry rubber content.

United Kingdom Statistics

IMPORTS

	February, 1930		Two Months Ended February, 1930	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude Rubber				
From—				
Straits Settlements	15,978,500	£528,368	33,288,200	£1,094,272
Federated Malay States	6,563,100	218,401	13,189,300	437,089
British India	2,134,100	69,335	3,936,100	129,301
Ceylon and Dependencies	3,541,300	116,141	7,671,800	249,950
Java and Dutch Borneo	2,257,100	75,030	4,361,300	146,041
Sumatra and other Dutch possessions in Indian Seas	959,300	31,440	2,952,000	95,049
Other countries in East Indies and Pacific not elsewhere specified	302,900	10,462	513,000	17,781
Brazil	567,200	17,725	1,476,200	48,847
South and Central America (except Brazil)	.....	.....	3,200	106
West Africa				
French West and Equatorial Africa	138,400	4,508	138,500	4,511
Gold Coast	18,200	553	56,300	1,807
Other parts of West Africa	71,600	2,308	275,400	10,081
East Africa, including Madagascar	130,000	4,160	200,200	6,365
Other countries	171,100	6,619	456,500	16,722
Totals	32,832,800	£1,085,050	68,518,000	£2,257,922
Gutta percha and balata	369,900	26,318	998,900	80,275
Waste and reclaimed rubber	834,100	9,540	1,630,700	20,535
Rubber substitutes	37,500	659	40,700	738
Totals	34,074,300	£1,121,567	71,188,300	£2,359,470
MANUFACTURED				
Tires and tubes				
*Pneumatic				
Outer covers	.....	£24,494	.....	£43,379
Inner tubes	.....	7,007	.....	11,139
Solid tires	.....	3,819	.....	8,265
Boots and shoes, *doz. pairs*	120,353	128,944	209,039	249,129
Other rubber manufactures	.....	170,189	.....	382,007
Totals	.....	£334,453	.....	£693,919

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	2,008,200	£15,507	4,138,800	£33,547
Rubber substitutes	30,600	656	71,300	1,528
Totals	2,038,800	£16,163	4,210,100	£35,075
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£382,249	.....	£749,123
Inner tubes	.....	41,306	.....	93,277
Solid tires	.....	6,587	.....	14,253
Boots and shoes, *doz. pairs*	17,413	25,261	41,439	60,915
Other rubber manufactures	.....	207,268	.....	426,120
Totals	.....	£662,671	.....	£1,343,688

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED				
Crude rubber				
To—				
Russia	3,271,800	£121,679	5,508,100	£214,545
Sweden, Norway, and Denmark	65,400	3,905	269,100	12,325
Germany	1,751,200	58,869	4,776,500	164,228
Belgium	411,200	15,426	1,188,500	46,942
France	1,499,500	61,257	4,071,800	161,570
Spain	154,500	5,869	202,700	8,109
Italy	267,400	10,238	390,000	15,657
Other countries in Europe	156,700	7,768	826,000	34,035
United States	626,900	18,432	1,649,900	51,919
Other countries	159,900	7,421	289,200	14,246
Totals	8,364,500	£310,864	19,171,800	£723,576
Gutta percha and balata	22,100	2,340	84,700	7,393
Waste and reclaimed rubber	8,600	163	9,800	189
Totals	8,395,200	£313,367	19,266,300	£731,158
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£5,837	.....	£9,872
Inner tubes	.....	923	.....	1,394
Solid tires	.....	.....	.....	60
Boots and shoes, *doz. pairs*	2,642	3,458	3,475	6,201
Other rubber manufactures	.....	6,326	.....	13,540
Totals	.....	£16,544	.....	£31,067

*Motor cars, motorcycles, parts, and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

Dominion of Canada Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	December, 1929		Nine Months Ended December, 1929	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.	4,734,830	$821,708	53,465,767	$11,499,446
Rubber recovered	768,300	50,744	11,975,200	822,482
Rubber, powdered, and gutta percha scrap	849,600	39,481	5,065,700	183,809
Balata	100	199	3,352	2,042
Rubber substitutes	87,600	12,843	1,393,000	130,184
Totals	6,440,430	$924,975	71,903,019	$12,637,963
PARTLY MANUFACTURED				
Hard rubber sheets and rods	9,999	$4,248	75,008	$35,769
Hard rubber tubes	.....	.....	.....	13,543
Rubber thread not covered	35,590	33,808	213,276	202,913
Totals	45,589	$38,056	288,284	$252,225
MANUFACTURED				
Belting	.....	$8,305	.....	$148,065
Boots and shoes.....*pairs*	3,780	5,292	51,341	56,211
Cement	.....	2,184	.....	48,375
Clothing, including waterproofed	.....	13,708	.....	414,432
Gaskets	.....	412	.....	17,646
Gloves	.....	1,215	.....	13,985
Golf balls .....*doz.*	689	1,819	22,019	65,595
Heels .....*pairs*	137,858	5,953	1,354,865	61,627
Hose, including cotton or linen lined with rubber	.....	13,464	.....	223,125
Hot water bottles	.....	2,242	.....	41,108
Mats and matting	.....	6,287	.....	66,698
Packing	.....	3,727	.....	45,208
Tires, bicycle.....*number*	406	197	22,881	11,096
Pneumatic .....*number*	604	15,065	15,919	223,855
Inner tubes .....*number*	85	395	1,930	6,536
Solid for automobiles and motor trucks.....*number*	103	2,404	709	19,719
Other solid tires	.....	840	.....	12,905
Other rubber manufactures	.....	89,211	.....	1,150,945
Totals	.....	$172,720	.....	$2,627,131
Totals, rubber imports	.....	$1,135,751	.....	$15,517,319

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

UNMANUFACTURED	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Waste rubber	$9,362	.....	$205,667	.....
Totals	$9,362	.....	$205,667	.....
MANUFACTURED				
Belting	$26,736	.....	$478,775	.....
Canvas shoes with rubber soles	372,337	.....	4,875,051	.....
Boots and shoes	217,739	.....	2,939,374	.....
Clothing, including waterproofed	562	.....	25,179	.....
Hose	29,092	.....	222,268	.....
Tires, bicycle	624	.....	8,267	.....
Pneumatic	802,598	.....	11,666,129	.....
Inner tubes	92,951	.....	1,602,601	.....
Solid rubber	1,941	.....	105,069	.....
Other rubber manufactures	263,734	$4,511	1,896,436	$112,180
Totals	$1,808,314	$4,511	$23,819,149	$112,180
Totals, rubber exports	$1,817,676	$4,511	$24,024,816	$112,180

British Malaya

RUBBER EXPORTS

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for March, 1930, relating to ocean shipments of rubber from Singapore, Penang, Malacca, and Port Swettenham.

Destination of Shipments

	Rubber Tons	Latex Tons
United Kingdom	10,196	27
United States	28,539	150
Continent of Europe	5,235	64
British possessions	713	...
Japan	2,294	1
Other countries	101	...
Totals	47,078	242

Imports During March, 1930

	Dry Rubber Tons	Wet Rubber Tons
Sumatra	581	5,597
Dutch Borneo	599	3,634
Java and other Dutch islands	127	107
Sarawak	1,042	35
British Borneo	257	24
Other countries	932	301
Totals	3,538	9,698

Rubber Questionnaire

Calendar Year 1929*

	Long Tons			
RECLAIMED RUBBER	Inventory at End of Quarters	Production	Shipments	Consumption
Reclaimers solely	8,360	86,691	85,118	156
Manufacturers who also reclaim	9,864	118,233	42,657	93,496
Other manufacturers	3,996	.....	.....	70,617
Totals	22,220	204,924	127,775	164,269

	Long Tons		
SCRAP RUBBER	Inventory	Due on Contract	Consumption
Reclaimers solely	31,419	41,456	112,458
Manufacturers who also reclaim	43,484	64,203	160,460
Other manufacturers	348	.....	.....
Totals	75,251	105,659	272,918

TONS OF RUBBER CONSUMED IN RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS

PRODUCTS	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	289,118	$578,981,000
Automobile and motor truck pneumatic tubes	56,683	82,931,000
Motorcycle tires (casings and tubes)	259	1,348,000
Bicycle tires (single tubes, casings, and tubes)	1,277	2,877,000
Airplane casings and tubes	178	454,000
Solid and cushion tires	8,990	17,203,000
All other solid tires	805	2,365,000
Tire sundries and repair materials	4,493	16,868,000
Totals	361,803	$703,027,000

PRODUCTS	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Other Rubber Products:		
Mechanical rubber goods	22,282	$111,195,000
Boots and shoes	18,974	110,856,000
Insulated wire and insulating compounds	3,814	33,126,000
Druggists' sundries, medical, and surgical rubber goods	2,038	8,141,000
Stationers' rubber goods	1,326	2,560,000
Bathing apparel	765	2,987,000
Rubber clothing	1,479	8,536,000
Automobile fabrics	1,277	10,627,000
Other rubberized fabrics	2,354	9,493,000
Hard rubber goods	1,273	6,795,000
Heels and soles	6,318	23,759,000
Rubber flooring	1,122	4,584,000
Sporting goods, toys, and novelties	1,565	7,612,000
Miscellaneous, not included in any of the above items	2,767	11,867,000
Totals	67,354	$352,138,000
Grand totals—all products	429,157	$1,055,165,000

INVENTORY OF RUBBER IN THE UNITED STATES AND AFLOAT

	Long Tons			
ON HAND	Plantation	Para	All Other	Totals
Manufacturers	59,236	1,715	574	61,525
Importers and dealers:	39,202	1,845	548	41,595
Totals on hand	98,438	3,560	1,122	103,120
AFLOAT				
Manufacturers	12,101	...	4	12,105
Importers and dealers	39,837	358	50	40,245
Totals afloat	51,938	358	54	52,350

*Number of rubber manufacturers that reported data was 159; crude rubber importers and dealers, 46; reclaimers (solely), 8; total daily average number of employes on basis of third week of each quarter was 166,399.

It is estimated that the reported grand total crude rubber consumption and the grand total sales value figures to be approximately 92 per cent; the grand total crude rubber inventory 87 per cent, and afloat figures 78 per cent; the reclaimed rubber production 91 per cent; reclaimed consumption 77 per cent; and reclaimed inventory 78 per cent of the total of the entire industry.

Compiled from statistics supplied by the Rubber Manufacturers Association, Inc.

London Stocks, Febuary, 1930

	Landed for Feb.	Delivered for Feb.	Stocked February 28		
LONDON	Tons	Tons	1930 Tons	1929 Tons	1928 Tons
Plantation	9,785	5,653	64,452	25,439	62,827
Other grades	....	....	41	75	89
LIVERPOOL					
Plantation	†1,846	†1,090	†20,605	†4,105	†2,343
Total tons, London and Liverpool	11,631	6,743	85,098	29,619	65,259

† Official returns from the recognized public warehouses.

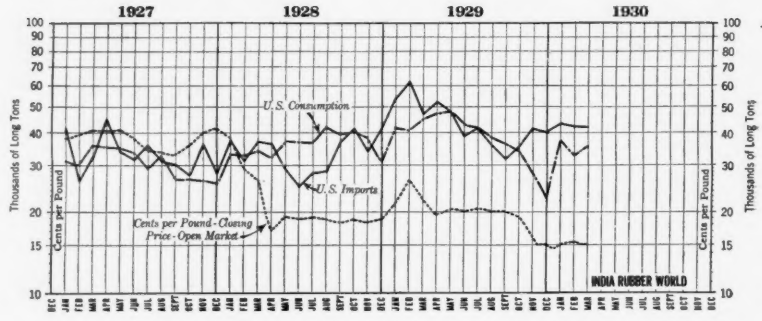
Imports, Consumption, and Stocks

THE accompanying graph represents the official closing prices of the Rubber Trade Association of New York for spot ribbed smoked sheet rubber. Prices have remained around the 15-cent level since November 1, 1929.

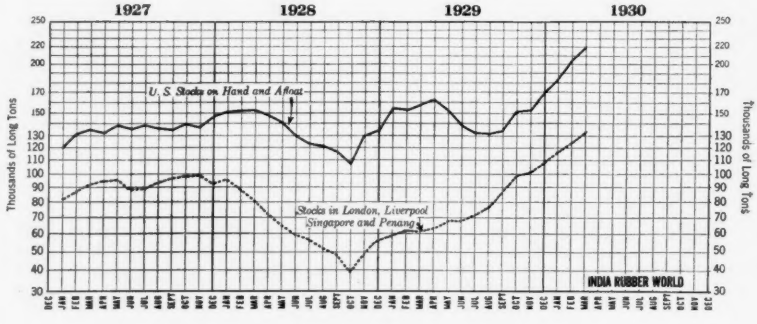
Net imports for March, 1930, were 42,339 tons, an increase of 966 tons from those for February. March consumption was 35,914 tons, an increase of 3,188 tons over that for February. The Henderson Rubber Reports, Inc., estimates April imports at 44,500 tons; consumption, 41,000 tons; stocks afloat, 68,000 tons, and on hand in the United States, 147,500 tons.

These estimates reflect the steady recovery of rubber goods production. This is, of course, largely due to the gradual picking up of the automobile industry and the return of the spring motoring season which involves more or less new tire and tube equipment. Some increase of consumption will doubtless be contributed by mechanicals and footwear.

London stocks between March 22 and April 26 showed steady increase. The weekly record is as follows: March 29, 69,233 tons; April 5, 71,477 tons; April 12, 72,333 tons; April 19, 73,253 tons; April 26, 74,084 tons. The weekly record of Liverpool stocks is: March 29, 21,198 tons; April 5, 22,008 tons; April 12, 22,676 tons; April 19, 22,663 tons; April 26, 23,546 tons. Between March 29 and April 26 Liverpool stocks increased 2,348 tons.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets



United States, British and Malayan Rubber Stocks

United States Statistics of Rubber Imports, Consumption, and Stocks

Twelve Months	*Net Imports Tons	Consumption Tons	Stocks on Hand Tons	Stocks Afloat Tons	Total Domestic Stocks Tons	British and Malayan Stocks: London & Liverpool Tons	British and Malayan Stocks: Singapore & Penang Tons	British and Malayan Stocks: Total Tons
1925	385,596	388,000	50,985	52,421	103,406	6,328	18,840	25,168
1926	399,972	366,000	72,510	51,238	123,748	51,320	26,443	77,763
1927	403,472	373,000	100,130	47,938	148,068	66,261	25,798	92,059
1928	407,572	437,000	66,166	68,764	134,930	22,603	32,905	55,508
1929	527,327	464,644	105,138	62,389	167,527	73,253	35,548	108,801
1929								
January	53,992	42,530	76,342	78,596	154,938	28,966	29,617	58,583
February	61,331	41,137	90.058	63,825	153,883	29,659	32,373	62,032
March	46,391	44,730	100,536	67,065	167,601	32,540	29,437	61,977
April	52,520	47,000	107,659	55,409	163,068	35,958	27,339	63,297
May	48,475	48,692	97,192	55,404	152,596	35,828	31,932	67,760
June	38,821	42,753	92,061	46,035	138,096	35,575	31,861	67,436
July	41,114	41,069	92,535	38,858	131,393	35,599	35,473	71,072
August	35,397	37,854	90,769	41,618	132,387	43,165	33.124	76,289
September	32,912	34,325	84,362	49,480	133,842	52,214	34,291	86,505
October	36,040	34,418	88,483	62,294	150,777	61,706	34,947	96.653
November	41,097	27,355	92,219	62,358	154,577	70,109	30,913	101,922
December	40,588	23,273	105,138	62,389	167,527	73,253	35,548	108,801
1930								
January	44,093	36,669	131,744	61,863	193,607	81,300	33,468	114,768
February	41,373	32,726	143,863	63,404	207,267	87,100	37,550	124,650
March	42,339	35,914	156,516	63,646	220,162	93,500	38,129	131,629

*Including liquid latex, but not guayule.

United States Crude and Waste Rubber Imports for 1930 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1930	Total 1929	Balata	Miscellaneous	Waste
January ..... *tons*	46,042	362	747	76	10	125	...	47,362	52,305	127	748	35
February	42,510	275	788	66	14	75	...	43,728	64,538	130	543	144
March	44,002	332	894	37	15	150	...	45,430	53,824	123	738	20
Total, three months, 1930..... *tons*	132,554	969	2,429	179	39	350	...	136,520	.....	380	2,029	199
Total, three months, 1929..... *tons*	*166,714	...	3,697	105	138	...	13	.....	170,667	232	2,844	570

* Latex included.

Compiled from Rubber Manufacturers Association statistics.